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THE TREATMENT OF VESICO-VAGINAL AND RECTO-VAGINAL FISTULÆ HIGH UP IN THE VAGINA.

By Howard A. Kelly, M. D.

It sometimes happens that, in the course of a vaginal hysterectomy for carcinoma of the cervix, or for uterine fibroids, the bladder is wounded either by intention or by accident, and a vesico-vaginal fistula results which it is often difficult to close.

The chief source of difficulty in handling such a fistula lies in its distance from the exterior, on account of which denudation and suturing are awkward; additional trouble is also caused by the proximity of scar tissue in the vaginal vault, which renders the tissues less plastic and less ready to heal when approximated.

I wish to urge a method of treatment of such fistulæ which I believe to be best adapted to overcome the difficulties. It consists in opening the peritoneal cavity widely from side to side, so as to free the bladder from its fixation at the vaginal vault and render it thoroughly mobile. By this means it becomes possible to displace the entire affected area downward to any extent required, and as that part of the bladder which lies above the vaginal vault, contiguous to the fistula is thus exposed, the latter can be included in the area of denudation, if necessary.

Before beginning the operation, the patient is placed in the knee-chest position, when the bladder becomes spontaneously distended with the air that rushes in through the fistulous orifice. This posture I now use in almost all vesical operations for the following reasons: The distended bladder can be easily and quickly incised in the vesico-vaginal septum, and then examined most satisfactorily by the finger, by the mirror, or by direct inspection. During any such operation the blood runs down the capacious vesical reservoir formed by the vertex, doing away with the necessity for constant irrigation or sponging. The actual amount of bleeding is far less than under other conditions. The field of operation is conveniently placed so that the operator works on a plane below or in front of him, and not above him. The tissues being tense are more easily handled than tissues that are flaccid and collapsing. Lastly, a great advantage is found in the fact that when vesical and vaginal tissues stretched in this way are incised, they tend to slide apart in different planes, so that it is easier to lay bare adjacent portions of the bladder in detaching the vagina.

The steps in the operation are as follows:

(1) The patient having been placed in the knee-chest position, her body is properly supported, and her neck well protected from pressure by soft cushions.

(2) The vagina is thoroughly cleansed for the operation. This may be done before taking the position.

(3) The vault is opened in the line of the transverse scar through into the peritoneum, by making a small incision in the attenuated septum. As soon as this is done the air rushes in and the viscera drop towards the diaphragm.

(4) The little opening is now extended as widely as pos-

sible from side to side, destroying the vaginal vault and setting the bladder free.

(5) A large gauze pad with a stout thread attached is next thrust down into the peritoneum, and by pulling on this the bladder is crowded towards the vaginal outlet while the peritoneal cavity above is protected. It is important throughout to wipe out the cavity of the bladder from time to time in order to avoid the escape of any of its contents onto the peritoneum.

(6) The margins of the fistula are now split, separating the vagina from the bladder, or if the operator prefers the older methods, the fistula is denuded on all sides.

To split the margins I use a short-bladed, thick knife, sharpened on both edges and set in the handle at an angle of about 45 degrees as shown in the figure; this is better than a longer thinner blade, which tends to perforate the flaps. See Fig. 1. An ordinary scalpel or a bistouri cannot be used.

Fig. 1.

(7) When the edges are split and the bladder wall is set free, the bladder is sewed up separately by means of a row of buried sutures of fine silk or of catgut, thus uniting the muscularis alone, by this means the vesical edges are turned up into the cavity of the bladder, forming a little buttress (Sänger and others).

The vaginal surface is then united with a row of fine silkworm gut sutures. I use by preference a grade of gut which is reckoned inferior in quality, because it is finer and more flexible. This row of sutures may be continued up onto the peritoneal surface of the bladder, in this way easily and securely covering in that upper part of the fistula which under previous methods of treatment was least likely to heal. There must be no dead space left between this and the buried row of sutures. The silkworm sutures are cut off at about 4 cm. from the knot.

(8) The fistula being now closed, the pack is withdrawn, and then in order to get rid of the air in the peritoneum, the cavity is filled through a tube with a normal saline solution which, as it rises to the level of the vagina, displaces the air. When the patient is turned over onto the dorsal posture all the water escapes.

(9) A little suturing at each angle and a drain of washed-out iodoform gauze (Sänger) in the middle, and one in the vagina complete the operation and the dressing. It is best to keep a catheter in the urethra for from 7 to 9 days following the operation. I have closed several fistulæ of this group by opening the peritoneum, but I have not as yet made the wide lateral dissection proposed here.

An accident revealed to me another plan of treating fistulæ which may sometimes prove a valuable resource.

I cured the fistula in question by first making it larger and thus securing the coaptation of the more difficult and inaccessible part; and at a subsequent operation I closed the newer portion which was easy of access. The method in detail was as follows:

The patient (San. No. 9237) had a vesico-vaginal fistula about 1.5 cm. in diameter, situated at the vaginal vault in the midst of an area of unyielding scar tissue, following a vaginal hysterectomy for carcinoma. She had had eleven unsuccessful operations before I saw her. I attempted at the twelfth operation, the patient was in the knee-chest posture and with the perineum elevated by a speculum, to free the fistula and make it easier to handle by first incising the thin septum at the vault and opening the peritoneum for 2 or 3 cm. from side to side, but I did not make the broader lateral incisions recommended above. The next step in the operation was to cut through the vesico-vaginal septum from the lower margin of the fistula down into the vesical trigonum. This enabled me to separate the bladder from the vagina with ease all around the edges of the fistula, which were not pared at all, and no tissue whatever was removed. The vesical walls were then turned in towards the bladder cavity and the muscularis vesicæ united by fine interrupted catgut sutures. The vaginal walls were then closed with similar catgut sutures over the line of union of the bladder. The lower part of the wound nearer the urethra was approximated also with catgut.

Union failed in this lower tract where the new wound was made and succeeded in the upper more rigid and more inaccessible portion.

A second operation was then done by simply paring and uniting the edges of the fistula with interrupted silkworm-gut sutures, including all the tissues up to the vesical mucosa.

This operation succeeded perfectly and the patient returned to her home in Michigan completely restored.

The plan of separating the bladder on all sides from its peritoneal attachments in order to mobilize it, and make it more accessible to surgical treatment, can also be applied with even greater satisfaction to recto-vaginal fistulæ situated high up in the vagina. In this case the absence of the uterus is not needed to facilitate the exposure of the fistula, as it is only necessary to open the peritoneal cul-de-sac behind the cervix widely from side to side and down at the sides of the rectum to gain the great advantage of increased mobility of the bowel, including an area above the fistula which can also be turned in by sutures so as to cover in the upper angle of the opening.

I prefer in these cases, after completely detaching the vagina from the bowel, to infold and sew up the bowel separately with fine silk sutures in one or two layers, and then I do not attempt to close the vaginal wound over the bowel, but put a little iodoform gauze drain between the edges of the vaginal opening and allow the wound to close by granulation. An opening should be left in the peritoneum wide enough to admit a small iodoform gauze drain.

CYCLIC ALBUMINURIA.[1]

By Wm. E. Huger, M. D., Charleston, S. C.,
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Two years ago, two very interesting cases of albuminuria came under my observation, and it has been my good fortune since to be able to follow them closely. Case I came to the Genito-Urinary Department of the Johns Hopkins Hospital with an acute attack of gonorrhœal urethritis, and it was only after this had subsided somewhat that the disease with which my paper deals was discovered. Case II was first seen by Dr. Thomas in the Neurological Department of the Hospital, and was subsequently turned over to me, because of my interest in his accidentally discovered albuminuric condition.

Histories.

Case I.—W. W., age 18 years. Sept. 6, 1899.

Complaint.—Urethral discharge.

Family History.—Negative.

Past History.—Only measles of the children's diseases. Always a fairly strong boy. Never any pain in the abdomen. No colic of any kind. No previous attack of gonorrhœa. No syphilis. At the age of twelve he began to masturbate and has continued about two or three times a week since then. About one month ago began going with women. Has never had his urine examined.

Present Illness.—A running from urethra began four days ago. Incubation four days. All the symptoms of a mild gonorrhœa were present, but no complications. Works in a barber shop and takes very little outdoor exercise.

Physical Examination.—Rather an anæmic boy but fairly well developed. Heart, an extremely faint systolic murmur at apex in the 5th interspace just outside the nipple line. Second aortic *not* accentuated. Arteries soft. Tension low. Lungs negative. Abdomen soft, no tenderness. Kidneys not palpable. Genitalia small but normal. Slight purulent discharge from the urethra. Microscope shows it to contain leucocytes and epithelial cells, intra- and extra-cellular, biscuit-shaped diplococci decolorizing by the Gram stain. Urine: 1st glass very cloudy with pus; 2d glass clear with no shreds.

The patient paid three visits a week for about one month and had the varying ups and downs to which many gonorrhœal cases are subjected. At the end of this time the urine having cleared up sufficiently, I tested for renal albumin and was surprised to find an abundant precipitate on boiling the urine, which did not clear up on the addition of acetic acid. The test was repeated with a carefully filtered specimen and the same result obtained. Hyaline casts were found in great numbers in a centrifugalized specimen, the urine having been voided at 12.30 p. m. The next day an examination made at 9.30 a. m. showed less albumin and fewer casts. A third specimen voided on rising and brought to me showed no albumin and no casts.

He was then sent into one of the medical wards at the hospital, where he remained three days. He was put to bed, and placed on a milk diet for two days, but as the report of "no casts and no albumin" was made, on the third day he was allowed to get up and was put on a meat diet. His urine examined on the fourth morning being again negative, he was sent home. I wish here to call attention to the fact that the urine examined in the hospital was in each case that passed in the morning after prolonged rest in bed. As I proved later, had the urine been voided and examined at intervals during the day, the observation would have been different.

On the morning after leaving the hospital the patient came to the dispensary again, and as before, the urine passed contained a quantity of albumin (.2 per cent) and a number of casts, hyaline, granular and a few epithelial.

The patient was given eight two-ounce bottles which were to be used as follows: He was to urinate in the first one just before retiring; in the second, about an hour later; in the third, on rising; in the fourth, one hour after breakfast; in the fifth, at 12 m. (just before dinner); in the sixth, one hour after dinner; in the seventh, at five o'clock (just before supper); and in the eighth, one hour later. The object of urination at bedtime and a half-hour later was to wash out any albuminous urine which had descended from the kidneys previous to lying down, in order that the morning specimen might be urine secreted only while the body was in the horizontal position.

Case II.—H. C., age 18 years; drug clerk. Dec. 10, 1899.

Complaint.—Nervousness and eye trouble.

Past History.—No malarial fever, no scarlet fever, no diphtheria. Has had measles and whooping-cough. No venereal disease. Four years ago patient had a severe fright, his life being threatened by some man. Has masturbated quite frequently but has never had sexual connection. Three years ago his mother died and he had a slight hysterical attack. Then, none again until the present time.

Present Illness.—Three weeks ago the patient had a return of the "fits" like the one which occurred when his mother died. This time they were frequent and accompanied by a severe pain in the left frontal and temporal regions. The pain has been present during the entire time, but is most intense just before and after a "fit." He was obliged to go to bed and has only just left it for the purpose of consultation. The bowels are regular, and except for a marked nervousness there is nothing unusual in his history.

Physical Examination.—Slender, nervous looking youth, apparently backward for his years, both mentally and physic-

[1] Read before The Johns Hopkins Hospital Medical Society, June, 1901.

ally. Occasional twitching of both eyelids and of the muscles of the mouth. Eyes: right one normal; left has a distinct optic neuritis (Dr. Reuling); measurements not made. Lungs negative. Heart negative. Arteries soft, pulse of high tension. Abdomen negative. Kidneys not palpable. Penis and testicles normal. Urine varies as will be described.

This case was followed in exactly the same manner as the

Both were young men, one healthy and uncomplaining (except for gonorrhœa), the other nervous and sickly. Both had been in the habit of masturbating, but probably not more than the average boy. Neither showed any albumin in the urine voided on rising. Both reached their maximum amount (.2 per cent) about four or five hours after rising, and had a gradual decline in the next six or seven hours,

1899.	P. M. 8.30	P. M. 9.30	A. M. 6.30	A. M. 8.30	A. M. 10.15	M. 12	P. M. 12.15	P. M. 1.30	P. M. 5	P. M. 6.30		Remarks.
Nov. 8.	1011	1007	1015	1015	1016	1020	..	1020	1012	1013	Sp. gr.	The amount of albumin was rarely ever the same at the same time each day.
Nov. 9.	Some	Trace	None	Much	Much	Quant'y	..	Quant'y	Some	Some	Albumin	
Nov. 10	Few	Few	None	Many	Many	Many	..	Many	Few	Few	Casts—hyaline, granular, epithelial	
Nov. 13	1015	1005	1015	1022	1020	1019	..	1015	1015	1012	Sp. gr.	The evening of the 13th the albumin and casts were greatest without apparent reason.
Nov. 14	Much	Less	None	Much	Quant'y	Quant'y	..	Quant'y	Much	Less	Albumin	
Nov. 15	Some	Few	None	Some	Many	Many	..	Many	Some	Fever	Casts—hyaline, granular	
Nov. 19	1023	1006	1020	1015	1020	1020	..	1012	1020	1022	Sp. gr.	In spite of severe exercise, no increased albumin was found on the evening of the 19th.
Nov. 20	Trace	None	None	Trace	Slight	Quant'y	..	Much	Much	Much	Albumin	
Nov. 21	One	None	None	Some	Few	Many	..	Some	Some	Some	Casts—hyaline, granular	
Nov. 26	1015	1004	1014	1007	1011	1012	..	1016	1015	1010	Sp. gr.	
Nov. 27	Trace	None	None	Trace	Some	Gr. quant'y	..	Much	Much	Less	Albumin	
Nov. 28	Two	None	None	Few	Some	Many	..	Some	Some	Fever	Casts—hyaline	
.....					1015			1015	..	..	Sp. gr.	Patient voided on first coming in and then sat quiet until 1.30 P. M., yet this second spec. showed more albumin.
.....					Some	Spec. II.....		Much	..	..	Albumin	
Dec. 1 ...	Spec. I				Few			Many	..	..	Casts—hyaline, granular, epithelial	
Dec. 3 ...					..	1016	1016	1012	..	..	Sp. gr.	Voided at 12 M., then put in horizontal position. Voided at 12.15 P. M., keeping same position, and, rising at 1.30 P. M., voided again.
.....					..	Some	None	None	..	..	Albumin	
.....					..	Few	One	None	..	..	Casts—hyaline, granular	
Dec. 4	1024	1020	1023	1018	1019	1015	..	1015	1017	1020	Sp. gr.	
Dec. 5	Trace	Trace	None	Some	Some	Much	..	Much	Some	Trace	Albumin	
Dec. 6	Two	Few	None	Few	Some	Many	..	Many	Few	Fever	Casts	
Dec. 7	1006	1005	1011	1006	1010	1012	..	1015	1007	1008	Sp. gr.	
Dec. 8	Some	Trace	None	Some	Some	Quant'y	..	Gr. quan.	Some	Some	Albumin	
Dec. 10	Few	None	None	Some	Some	Many	..	Quant'y	Few	Few	Casts	
Dec. 11												
Dec. 12												
Dec. 13	Each of these was a twenty-four				1010	1007	1015	1011	1012	1012	Sp. gr.	
Dec. 14	hour specimen				Some	Some	Some	Slight	Some	Much	Albumin	
Dec. 15					Few	Few	Some	Few	Few	Many	Casts	
Dec. 16												
1900.												
Feb. 18	1017	1010	1020	1015	1015	1023	..	1020	1009	1015	Sp. gr.	Patient went to bed at 11 A. M., ate a regular meat and vegetable dinner in bed.
Feb. 19	Some	Trace	None	Some	More	None	..	None	Some	Some	Albumin	
Feb. 20	Some	None	None	Some	More	None	..	None	Some	Some	Casts	
.....	1015	1008	1023	1014	1010	1006	..	1011	1020	1020	Sp. gr.	Patient went to bed at 11 A. M., exercised vigorously sitting up in bed. At first exam., 10.15 A. M., he had not yet exercised.
.....	Trace	Trace	None	Some	Some	Much	..	Much	Some	Less	Albumin	
.....	Few	Two	None	Some	More	Many	..	Many	Some	Fever	Casts	
.....					A. M. 10.10	A. M. 10.35	A. M. 11.30	Patient voided at 10.10 A. M., was then laid on a table. In 25 minutes he				
.....	..	..	..	..	Much	None	Much	voided again (10.35 A. M.). At 11.10 he was gently raised into the erect				
.....	..	..	..	..	Many	None	Many	position and in 20 minutes voided again.				

Three dates are grouped because the 8.30 P. M., etc. hours are on date Nov. 8th, for instance, the 6.30 A. M. the next morning, Nov. 9th, and the 10.15 A. M. specimen, and occasionally others about that time, was voided the day following, Nov. 10th in my presence, when the patient brought me the bottles of his urine passed on the two days previous, as directed.

other, but owing to the hysterical attacks, I was obliged to keep the patient in bed for a period of three weeks, which fact gave added data. Both of these cases were so very similar in their course under the same conditions that, although they were examined equally carefully, I will only give a detailed description of the different specimens of urine belonging to Case I, a simple analysis of the urine of Case II, and then note where differences occur.

but no absolute disappearance of the albumin until the body was again in the horizontal position. Case I has continued in much the same condition as when first seen (Sept. 6, 1899-Sept. 1, 1901). Case II was first seen Dec. 10, 1899, and ran his usual course until Feb. 22, 1900, on which date I made the following note:

"This afternoon the patient was seen at his home and in bed. For several days he has been having two and three

convulsions daily. While sitting by his bed, suddenly he told me that a 'spell' was coming on and that he was powerless to prevent it. The eyelids began to twitch, then the lips, fingers and arms. The motions increased in rapidity, becoming very rapid. Suddenly, with a quick movement the right or left hand would be grabbed between his teeth and held firmly in spite of vigorous efforts made by me to release it. The eyes assumed a wild vacant stare. At times he snarled like a dog. Finally, the head fell back and the patient was in a position of mild opisthotonos. The attack lasted ten minutes and then consciousness which had been lost from the beginning was gradually regained. For sometime, about half an hour after he regained consciousness, he was unable to see out of the left eye (the one in which the optic neuritis was found). The urine passed just after the attack was clear, acid, sp. gr. 1026, no albumin, no casts and no sugar."

For three weeks he was confined to his bed, having these hysterical attacks in gradually decreasing numbers and intensity. Never once during this time did any albumin appear, and for three months afterward it was absent, although the patient was up and about as usual. At the end of that time there was a recurrence of the albumin as before, only the maximum amount was increased to .25 per cent. He has had but one slight hysterical attack since those above described.

I will add a few remarks in explanation of the urine chart. As I have said before, the chart belongs, strictly speaking, to Case I, but Case II differed in no material way from it.

The hour 8.30 p. m. is taken as the starting point, because then it was that the patient voided into his first bottle and next at 9.30 p. m., so as to prepare his bladder for the reception of the urine secreted during the night. It is understood also that the patients went to bed at 8.30 p. m. and did not rise again, except at 9.30 p. m. to void, until 6.30 a. m., when the third specimen was obtained. This last was the urine secreted with the body in the horizontal position. Under "remarks" on the urine chart will be found notes on special experiments.

Once every month up to Sept. 1, 1901, I have examined the eight specimens of urine, the patient continuing his daily life. Each time the result has been as detailed above. On Jan. 7, 1901, I examined a specimen from Case I, voided at midnight after the patient had been on his feet working from the early afternoon until that hour. There was only a trace of albumin and one or two hyaline casts. Distinctly less than was usually found in the 8.30 p. m. specimen.

The cases of cylic albuminuria detailed above differ from almost all others reported in that they both show casts in abundance. I found a few previous records in which casts were mentioned either as a possibility in these cases or were mentioned as being found now and then in the specific reports, but nowhere were the casts said to be present, as in these cases, whenever albumin was found and in proportion to the amount. The casts were principally hyaline of the small variety, but often the granular variety was present, and on several occasions definite *epithelial* casts were found.

To determine approximately the relative number of casts, I took fifteen cubic centimeters of urine from each specimen and centrifugalized this quantity for five minutes at between 1200 and 1500 revolutions per minute, then examined under the microscope for fifteen minutes when the casts were very few or none at all. When they were numerous, prolonged search was of course unnecessary. The amount of albumin reached .2 per cent about midday, though it was not so high every day. The chemical character of the albumin (serum-albumin) will be spoken of later.

In neither case did food have any influence on the amount of albumin eliminated. A relatively larger amount of albumin was just as apt to be in the urine passed just before dinner (12 m.) as in that passed an hour after. At no time was either the merest trace of albumin or any casts found in the early morning specimen, and only once in any great quantity during the evening. For this last I can assign no reason. Once at 9 p. m. I made the patient run for a half-mile before voiding, but the quantity of albumin was not increased above the amount usually found at that hour.

On several occasions the patients went to bed at eleven o'clock in the morning, voiding on lying down and again soon after. Both these specimens contained albumin and casts in the usual amounts. Dinner was eaten in the reclining position, and then the urine voided on rising an hour and a half later contained neither albumin nor casts. But the five o'clock specimens had their customary albumin and casts.

The urine passed thirty-five minutes after lying down showed no albumin and no casts, provided the bladder had been emptied soon after reclining for the reason before stated. But in twenty minutes after the erect position had been assumed, no matter if the patient had been gently and slowly lifted into it, albumin and casts reappeared. The quantity of albumin after a change of this kind was always even greater than before lying down, but soon returned to the same amount and then continued to increase or decrease according as it had been previously on the increase or decrease. The relative position of the legs and body if the patient sat in a chair made no difference, a small amount of albumin and corresponding number of casts being secreted. Only on rare occasions did I find oxalate crystals.

The amount of literature on the subject of cyclic albuminuria, as may well be imagined, is extensive because beside the scientific interest in the disease, it bears a very close relation to the business risks involved in life insurance. Many writers have watched their cases pass through the cyclic stage to a successful recovery, one or two have seen Bright's disease develop, and again a great number have noted that the cyclic symptoms were still manifest at the time of their publications. These last should interest us most because the first two are settled and we need the other to help decide beyond a doubt the uncertain question of prognosis. Unfortunately, there seems very little chance

that many will continue their reports, or that others will take up at a later date, those cases already reported.

No post-mortem has been performed on a case known to have been suffering from cyclic albuminuria at the time of death, so that the pathological condition is based on theory and differs as widely as conclusions so supported always do.

Up to the year 1878, any albumin in the urine was generally considered as indicative of a very serious result and little hope of recovery was expressed. At this time Moxon (1) published a paper in which he speaks of Intermittent Albuminuria, or the albuminuria of adolescence and of Remittent Albuminuria. He reports seven cases of the former, but refers only in a general way to nineteen coming under the head of Remittent Albuminuria. He says that in these latter the albumin is present in greater or less quantity during the day, especially in the urine passed after breakfast, but that no albumin is present in the urine passed on rising from bed after a night's rest. He divides them into two groups: (a) In which there is no reason other than the albumin to suspect the existence of renal disease, and (b) where further symptoms show that the renal system is seriously at fault, in fact, that Bright's disease exists. He says that the pulse is of low tension. No cases were recorded individually. Johnson (2) had already drawn attention to the same facts in 1873. He believes that most cases of cyclic albuminuria are merely cases recovering from an acute attack and that they can always be traced to the exciting cause. Later (3), he showed that whether or not Moxon was right, he did not give sufficient data for drawing his conclusions. Rooke (4) gives two cases, ages 14 and 16 years. In one the urine was examined several hundred times and never once was albumin found in the morning specimen. The patient was kept in bed once for three weeks. During this time there was an absolute disappearance of the albumin, but immediately on rising it reappeared. In the other case the results were the same with similar experiments. In 1881, Dukes (5) mentioned an albuminuria which could be gotten rid of in an hour or two by putting the patient to bed and could be reproduced almost at will by getting him up.

World-wide interest in this peculiar condition was not aroused until Pavy (6), in 1885, described very minutely the clinical changes in what he called "Cyclic Albuminuria." He mentions six cases, all young men. Two were seen a year later, one had no albumin and one only a trace at midday. Three were seen two years later and none had albumin. The sixth was followed for four years, during which time the condition lasted. In 1886 (7), he added three more cases to the above, two boys and a girl. All his patients were free from albumin on rising, had more or less present at midday, and with some it was absent in the evening before going to bed, but most had a trace as long as they were up. The albumin was present in spite of fasting during the morning when they were not in bed, but, if they remained in bed, none appeared in spite of much food or even a cold bath. Since Pavy's time a great deal has been written, and yet only in a few details do the accounts differ from his, hence by many it is called Pavy's disease. Probably Pavy's own term, Cyclic Albuminuria, is the best, because although it is cyclic only under the same daily conditions, those are the ones under which we live and we are obliged to change those conditions when we wish an alteration in the cycle.

One statement in his article started a discussion that has been taken up the world over and of which we have not yet heard the end. Another is of especial interest when taken in connection with this paper. First, he unhesitatingly calls the disease functional, says that there is nothing to show that it is the beginning of Bright's disease or that it leads to anything serious. Second, that no tube casts are found. This last has been accepted and confirmed by almost every one. Kraus (8), Oswald (9) and Landi (10), who are the chief ones mentioned all through literature as having found casts, barely state this fact. Hawkins (11), too, speaks of the possibility of their presence, but gives no cases. Marie (12) says that casts sometimes appear but that there were none found in the case which he reports.

Symptoms.—Often there is nothing to attract attention to the urine, as the patient either has no complaint or perhaps merely complains of a languid feeling and protests that he is not sick. Marie grants that symptoms are usually absent, but adds that in addition to the languid feeling there may be palpitation, neuralgia or even dizziness and epistaxis. Arnozan (13) adds neurasthenia, œdema of the face, headaches and cramps. One of my cases had absolutely no symptoms, and it was by chance alone, or rather by routine examination of all urines, that the albumin was discovered. The other case had, besides hysterical attacks, a distinct optic neuritis of one eye which improved later with an improvement in the patient's general condition. Ostwalt (14) reports two cases of cyclic albuminuria with optic neuritis and no other symptom.

PATHOLOGY.

Marie cannot explain the pathological condition, but believes it a functional state, certainly probable in his case. Capitan (9), de Chateaubourg (9), Leube (9), Finot (9), Zechnisen (9), Lasiadke (9) and Granger Stewart (15) say that albumin is an abnormal constituent of urine, but that it can occur without any ill effects on the patient. Klugden (9), Senator (9) and Posner (9) believe albumin can occur physiologically. Pavy, as I have noted, calls cyclic albuminuria functional. Klemperer (16) says: "Every sign of Bright's disease is absent. It does not run into renal disease." Lecorché and Talamon (9), replying to Senator, are strongly in favor of the latent nephritis theory. Talamon says that some authors call cyclic albuminuria functional because they are unable to conciliate the cyclic symptoms with an organic lesion. Osler (17) maintains that the presence of albumin in the urine in any form and under any circumstances may be regarded as indicative of change in the renal or glomerular epithelium. Arnozan, too, says that albumin in urine is always pathological, that it does not

result from high tension, but may show a slowing and stagnation of the blood current, and that even in the cyclic cases it is dependent upon epithelial changes. He adds that it is due either to infection or intoxication. Ostwalt draws the following deductions from the literature and his own cases:

"(1) Alterations in the walls of the vessels certainly play an important part in the production of cyclic albuminuria.

(2) In one case (of his own) certainly the change in the walls preceded albuminuria.

(3) We may believe that this change of the vessels is in consequence of destructive tissue change.

(4) The functional insufficiency of the vessel walls allows the albumin to pass into the urine when the renal vessels are in an unfavorable hydrostatic condition.

(5) Oxalate of lime circulating in the blood may act as an irritant causing albumin."

Pavy was inclined to the theory that oxalate of lime was one of the etiological factors in bringing on albuminuria. In my cases, I rarely found these crystals, although I always looked carefully for them.

Oswald and Ott (9), Beckman (9), Bull (18) and Landi believed the condition pathological. Hawkins says that the view generally held to-day is, that the actual seat of the trouble appears to be in the vasomotor mechanism, which regulates the flow into and out of the glomeruli, and not in the kidney structure itself.

Several times a question as to the character of the albumin has arisen and each time the tests proved serum-albumin to be present. I followed the tests as laid down by West (19), and in both my cases found a large percentage of serum-albumin.

Etiology.

Adolescence is the period of life most liable to the disease, but it may occur at any age. *Sex.*—It has been found more frequently in the male than the female. The percentage is still pretty much the same as found in 1895 by Dubreuilh, males 88 per cent, females 12 per cent. *Food.*—Herringham (20) tried the effects of food in varying quantities and qualities, but found that the albumin came and went according to position, but absolutely irrespective of diet. This author had one case and his report of it is well worth considering. Neither the acidity of the urine nor the relative amounts of urea and uric acid bore any constant relation to the albuminuria. During an entire month the albumin ceased, although there was no change in the patient's way of living. No casts were found, but there were plenty of leucocytes and oxalate crystals. The only thing which in any way affected the albumin was the erect position, and he concludes that it resulted from an increased weight of blood resting on the renal veins. A weak circulation and general loss of tone, common in these cases, predispose to a condition of venous stasis. The kidney by reason of its double capillary system is more liable to stasis than other parts. The greater liability to albumin in the forenoon is due to a weaker circulation at that time. Bouchard (9) claims that the albumin is due to some toxicity of the blood which is greater during the activity of the morning hours, less towards evening and least of all during the quiet of sleep. These two statements are rather opposed to each other, one says the circulation is poorer in the morning and the other that it is more active. The truth is that it depends upon the actions of the individual. A vigorous circulation can be aroused morning, noon or night by making the patient exercise. When I did this, it did not matter at what hour, the presence of the albumin depended entirely upon the position of the body. Exercising violently when standing at 1 p. m. did not increase the albumin usual at that hour, and yet exercising the upper extremity and lower extremity when the body was lying down brought no albumin. Moreover, if a toxin were the cause, as Bouchard claims, it could hardly be gotten rid of in a few minutes after reclining, and yet the albumin certainly disappeared in a very short time.

The acute, infectious diseases, especially the eruptive fevers, are said to be followed sometimes by cyclic albuminuria. Marie and Johnson emphasize it. This distinctly suggests that cyclic albuminuria is merely a phase of mild degree of that true nephritis which is so frequent a sequela of the eruptive diseases. In one of my cases the albumin was first discovered after an attack of gonorrhœa, but I have no more reason for believing it to be the cause than I have in the other case to think that his condition was due to measles or whooping-cough which he had in very early childhood. An interesting point is that on the question of blood-pressure one of my cases supports the views of the advocates of low tension, while the other, with a pulse of quite high tension, agrees with the views of those who consider it to be the cause. *Heredity.*—Gout and rheumatism are supposed etiological factors. Although Heubner (21) found several cases in the same family, Lacour (22) three in the same family, Schön (23) two, and occasionally others do the same, the evidence is too circumstantial and not sufficient to consider heredity more than a coincident.

Sir Wm. Gull (24) believed that the general nervous tone of the patients was poor and that the nerve supply to the renal vessels and parenchyma was correspondingly poor and slow to work. The increased blood-pressure upon the renal vessels caused by the erect position put more work upon the kidneys than they were able to perform, and the epithelial filter allowed some of the albuminoid material in the blood to pass through. This was gradually corrected as the sluggish nerves reacted to the stimulus, and after a time the previously increasing amount of albumin began to decrease.

Position.—Since attention was first drawn to this disease, no one has denied that position is the most powerful factor in influencing the albumin. In all cases, albumin disappears from the urine soon after lying down and reappears after rising, no matter how the hours are changed or how long the patients lie down. If they go to bed during the day and get up at night, albumin comes and goes correspondingly. If they eat or exercise while reclining still no albumin appears, but immediately after getting up it

shows itself and increases in amount for from four to six hours, then begins to decrease, although not entirely disappearing until the horizontal position is resumed. Herringham obtained no albumin when his patient sat upright with the legs elevated, but in both of my cases if the body was raised higher than an angle of thirty degrees from the horizontal plane, I obtained albumin without regard to the relative position of the thighs. When Pavy's cases were carefully lifted into position, no albumin appeared, but in mine it did.

Prognosis.

In 1896, the French Congress of Medicine discussed the prognosis of albuminuria at great length. Although the discussion was not confined to the so-called physiological type, it was on this that the greatest stress was laid, because, as Tessier (9) said, the prognosis of the definite, chronic, pathological nephritis was fixed. He believes that there is a functional albuminuria and that it is no more apt to become Bright's disease than a simple bronchitis is to develop into tuberculosis. His conclusion is based on twenty-eight cases of cylic albuminuria gathered by Merley and himself and followed by them for from nine to thirteen years. Four out of this number developed Bright's disease. The others got well or had only an occasional attack. This report of Tessier contains the greatest number of cases followed during the longest period of time. He gives a very good prognosis, but surely his own statistics reverse his opinion and were we dependent upon him alone for information we could not conscientiously give our patients the hope which further study of the literature shows justifiable. Pavy, Johnson, Senator and others have seen cases pass through the cyclic stage and go on to recovery. Tyson (25) advocates admitting these cases to life insurance.

A very frequent statement, and one that at first glance appears sound, is, that the prognosis depends upon the following:

1. Length of time the albumin lasts each day.
2. Length of time the condition has been present.
3. Amount of albumin, and
4. Whether or not casts are present.

But we must remember that in everything our prognosis depends upon both or one of two known facts: (a) The known pathological condition, or (b) the clinical life history of previous similar conditions, whether or not we can obtain the exact pathology. Here the pathology is open to discussion, we have more or less fixed ideas, but we have never been able to hold the kidney in our hands and show conclusively what is to be found. But we have the clinical life history of many previous cases of cyclic albuminuria. From 1878 to the present day, as I have said, the literature is full of them, and their careful study does not bear out the conclusions above stated. An almost unbroken rule in these cases is, that the albumin appears soon after the patient gets into the erect position, reaches the maximum from four to six hours later, and then begins to decline, but does not absolutely disappear until the horizontal position is again assumed. This practically throws out the first condition, because the length of time is the same in all.

Tessier's cases tend to show that the second condition is not true. Irrespective of the length of time the condition was present, a few continued to have exacerbations of albuminuria, the large majority recovered and four passed into Bright's disease. Statistics in regard to the amount of albumin present in each case are not to be obtained, but the majority report between .1 and .2 per cent, yet I find nowhere that those having the larger percentage in contradistinction to those having a lesser amount, passed into a continuous albuminuria. The relation between the amount of albumin and casts has yet to be studied.

The fourth condition sounds plausible from a pathological standpoint, but as a fact, only three writers say that casts were present in their cases, and they speak neither of a fatal termination nor of the development of a continuous albuminuria. The fatal results are to be found among the cases reported by men who state very specifically that casts did not occur. But I must admit a belief that with careful centrifugalization and examination casts would have been found in many cases where they were said to have been absent.

The specimens from both my cases were examined as I have described on a previous page, and I think there is no reason to doubt that they are cases of pathological nephritis. Casts were found in abundance, and not only hyaline and granular, but also on many occasions epithelial. The patients responded to all the tests reported, and in addition, while in the sitting erect position, gave albumin and the appearance of albumin, though they had been gently and slowly lifted into the erect position.

Drugs are found not to affect the disease. Many, as well as I, have tried the effects of many drugs, but there being no change due to them, it is unnecessary to consider them further.

Conclusion.

That the cyclic albuminuria, like the recognized pathological albuminuria, is due to one or perhaps all of three causes:

1st. Inflammatory and degenerative changes in renal structure, as evidenced by the finding of casts. There is every reason to think that by careful searching casts will be found far more often than previous reports lead us to believe.

2d. Alterations in the quality of the blood which render its serum-albumin more diffusible. There is nothing to prove an inferior diffusibility in these cases, but the patients are almost always anæmic.

3d. Alterations in the degree of blood-pressure. Here due to a mechanically increased pressure on the renal veins.

Having learned that occasionally these cyclic cases pass into Bright's disease, but that by far the majority have gotten well and that many have been followed for years and then lost sight of still in their same condition, it must

be admitted that Moxon and Arnozan were right in dividing them into two groups: (a) Those few which develop a continuous albuminuria, and (b) the vast majority which get well. Continued rest in bed for a prolonged period should always be urged because at any rate it removes the exciting cause. One of my cases remained free from albumin for three months after being in bed for three weeks.

I believe that by a *very careful* examination for casts a large percentage of cases will be found to contain them, and that the serious prognosis given because of their presence will be modified.

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(17) Osler: Principles and Practice of Medicine, Fourth Edition, 1901, p. 855.
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(22) Lacour: Lyon Méd., No. 25, 1897.
(23) Schön: See above, 21.
(24) Gull, Sir Wm.: (Moxon) Guy's Hosp. Reports, 1878.
(25) Tyson: Assoc. of Amer. Physic., 1888.
(26) Von Noorden: Deutsches Archiv. f. klin. Med., Leipz., 1886, xxxviii, 20.

ON A CYST ORIGINATING FROM THE DUCTUS THYREOGLOSSUS.

By G. Canby Robinson.

(From the Pathological Laboratory, Johns Hopkins University.)

The literature on the cysts of the anterior median cervical region is as yet not extensive, and although mention is made of them in all the text-books, in treating of the surgery of the neck, the actual number of cases reported is small. It has been shown by Kostanecki and Milecki[1] that, according to the light thrown by His on the development of the branchial arches and clefts, congenital fistulæ and cysts of the neck must almost always arise from the second cleft. One case described by Virchow originated from the first branchial cleft, but the third and fourth are almost entirely excluded. The outer openings of such fistulæ may be almost anywhere, but the nature of the fistula is determined by the more constant position of the internal orifice and the course of the canal. On this basis therefore cysts lying exclusively in the median line without connection with the skin or pharynx can hardly be explained as originating from the branchial clefts.

Verneuil[2] described cysts in the regio-thyrohyoidea, collecting descriptions of cases from the literature and discussed the possibilities as to their origin. He found several bursæ in the thyrohyoid region and thought that cysts might arise from them. Such cysts, however, would have an endothelial rather than an epithelial lining. He gave, too, Cruveilhier's description of the pyramidal prolongation of the thyroid toward the hyoid and concluded that the case described by Rouget which he quotes, must have arisen by a cystic dilatation of some part of this prolongation. This cyst lay in the position of the thyroid pyramid, was very easily enucleated and was lined with epithelium and filled with a fluid in which floated masses of epithelial cells.

In the development of the thyroid gland we have the appearance of paired lateral portions which are united by an unpaired median portion. This latter, developed in conjunction with the root of the tongue, becomes elongated to form a duct, the upper end of which opens on the surface of the tongue. This duct, the ductus thyreoglossus, which is lined with ciliated epithelium, becomes interrupted at one point in the early stages of development, and at that point the hyoid bone develops. Thus the upper portion is cut off as the blind lingual duct and the lower portion as the ductus thyroideus. Frequently there stretches from the hyoid bone downward a series of small masses of thyroid tissue.

Cysts have been observed to arise from the lingual duct

[1] Kostanecki and Milecki, Virchow's Archiv, Bd. 120, 121.
[2] Verneuil, Archives Generales de Medecine, 1853, T. 91, p. 185.

and from the subhyoid portion. Even from portions of the obliterated duct enclosed in the hyoid bone similar cystic structures have been derived. Neumann [3] ascribes the origin of many cases of so-called Ranula to the cystic dilatation of portions of the lingual duct, the lining of ciliated epithelium being thus easily accounted for. When these lie above the mylohyoid muscles they project into the mouth. In the case described by Haeckel,[4] however, the tumor projected anteriorly in the median line of the neck. It proved to be a cystic mass lined by ciliated epithelium but containing in its walls definite thyroid gland substance. Its nature was therefore indubitable.

He concludes his paper with the statement that the thyroid can leave remains behind throughout the whole course from tongue to the neck from which ciliated cysts may arise.

M. Benno Schmidt, Roser, Chiari and others observed cases in which cystic tumors were found in the median cervical region, with more or less thyroid tissue in their walls and a lining of ciliated epithelium. All of these could readily be referred to the ductus thyreoglossus as a point of origin.

This summary of the literature may throw light on the nature of the following case which occurred recently in the Johns Hopkins Hospital:

J. P., stevedore, aged 55, colored. Admitted on account of hemiplegia, presented a rounded swelling in the median line of the neck just above the thyroid region. He stated that it had been present as long as he could remember and that it had not increased in size nor given him pain or inconvenience. The tumor was regular in outline, smooth and rounded, and about 4½ cm. in diameter. It was not attached to the skin, which could be easily moved over it. Fluctuation could be felt.

The patient died after a second extensive cerebral hæmorrhage and at the autopsy the organs of the neck were removed *en masse* and sketched after dissection (Figs. 1 and 2).

The tumor proved to be a spherical unilocular cyst about 4½ cm. in diameter, with smooth rather thin wall. It lies upon and attached lightly to the sternohyoidei muscles, pushing them apart about 1½ cm. Vertically it reaches from the level of the isthmus of the thyroid to the level of the hyoid bone to the under side of the body of which it is most firmly attached, between the insertions of the above-named muscles. With the surrounding tissues and with the thyroid, the cyst is very slightly adherent and can be easily separated from them. On lifting it up the thyroid with its isthmus is plainly visible and seems quite normal. A narrow aberrant band of muscle runs upward from the centre of the isthmus to the lower surface of the body of the hyoid bone.[5]

The walls of the cyst are about ½ to 1 mm. in thickness and are quite smooth. Blood-vessels are to be seen coursing over them. On opening the cyst it is found to contain a glairy mucoid fluid with a mass of cellular detritus which microscopically presents only very much disintegrated cells with deeply staining nuclear fragments. Cholesterin crystals were not seen.

The lining surface is quite smooth and velvety. The innermost layer can, however, be scraped off, leaving the dense white opaque outer layers of the wall.

Sections through the wall show it to be composed of a compact laminated connective tissue, which is somewhat looser in texture toward the outside. There is some adipose tissue on the outer superficial portions of the wall.

The lining cells form generally a single layer of high columnar ciliated epithelial cells (Fig. 3), but there are often nuclei and smaller cell bodies intercalated at the bases of these cells like those seen in various other surfaces covered with such epithelium. The underlying connective tissue very frequently contains groups of lymphoid cells but is in general composed of elongated fibrous elements. No thyroid tissue could be found in the walls.

It seems that such a unilocular cyst lying in the median line, connected firmly with the centre of the hyoid bone, and lined with columnar ciliated epithelium, must be interpreted as being derived from the ductus thyreoglossus even although it is not directly or firmly connected with the isthmus thyroidea nor has any thyroid tissue in its walls. The nature of the epithelial lining eliminates the possibility of its being derived from the bursæ and there remain only the possibilities of a cyst derived from a hernia of the trachea and one derived from the entodermal end of a fistula of the 2nd branchial cleft. The median position and absolute lack of connection with either trachea or pharynx seem to rule these out and we must conclude that it represents those cysts which are developed from the ductus thyreoglossus at that region where it extends from its attachment to the hyoid toward the thyroid.

The case was given to me for study by Dr. MacCallum, whose help in reviewing the literature, etc., I wish to acknowledge.

[3] Neumann, Langenbeck's Archiv, Bd. 33, S. 590.

[4] Haeckel, Langenbeck's Archiv, 1894, Bd. 48, S. 607.

[5] Probably the Levator thyroidæ, first described by Soemmering, who named it Levator glandulae thyroideæ. Streckeisen (Beiträge zur Morphologie der Schilddrüse, Berlin, 1886), states that it occurs in 79% of his dissections. Testut describes it as an aberrant bundle running between the hyoid bone and the sternum, but in some cases stopping in its course to attach itself to the anterior surface of the thyroid.

THE JOHNS HOPKINS HOSPITAL BULLETIN.

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FIG. 1.—Shows the position of the cyst as it lies over the trachea in the median line. The thyroid is seen projecting beneath it on both sides.

FIG. 2.—The cyst with the sternohyoid muscles is turned upward on its attachment to the hyoid bone; the isthmus of the thyroid is exposed, showing a thin median strand of muscle fibres which run upward toward the hyoid.

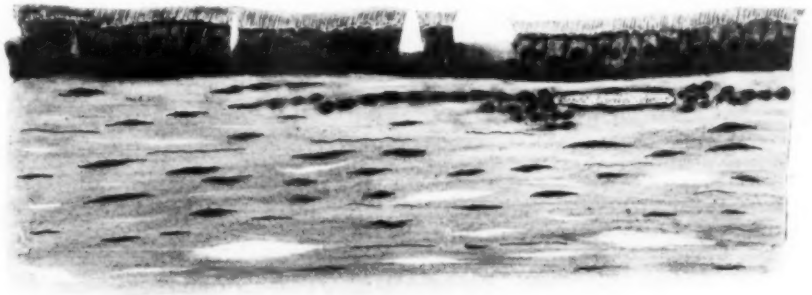

FIG. 3.—Section of the cyst wall showing the lining of ciliated columnar epithelium.

CATARRHAL OTITIS MEDIA (NON-SUPPURATIVE) AS A FACTOR IN THE ETIOLOGY OF FACIAL PARALYSIS.[1]

By H. O. Reik, M. D.,

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I desire to call attention to what I believe to be a neglected factor in facial paralysis, a factor which, if I do not overestimate it, is of importance not only as a means of explaining the etiology and pathology of a large class of cases but of prime importance in determining the best form of treatment to secure the most satisfactory results.

Heubschmann, in the recent edition of Church-Peterson's Diseases of the Nervous System, is quoted as saying that in a series of 135 cases of facial paralysis he found 6 per cent due to injury, 9 per cent to ear disease and 75 per cent to be of the so-called rheumatic or refrigeratory type. In Mayer's translation of Oppenheim, 1900, it is stated that exposure to cold is the cause of 73 per cent of the cases of facial paralysis occurring in otherwise normal individuals. These figures are probably approximately correct, for all text-books on diseases of the nervous system, or on the practice of medicine, contain the statement that exposure to cold is the principal cause of facial paralysis. None of these authors, however, as far as I know, give a satisfactory explanation of the pathological process involved, and in every instance where disease of the ear is mentioned as an active factor in the production of such paralysis it is evident that the author was considering a suppurative otitis media with necrosis of the bony wall of the tympanum. From a consideration of the evidence which I shall here adduce I am convinced that in the majority of cases, if not indeed in all, of facial paralysis of the "refrigeratory or rheumatic" class, an acute or sub-acute otitis media is an intermediary condition between the exposure to cold and the appearance of the paresis.

Herter, referring to the pathology of this affection, in his article in Nervous Diseases by American Authors, says "it was formerly thought that exposure to cold caused facial paralysis by paralyzing the terminations of the nerve in the facial muscles. There is now good reason to believe that the affection always depends upon an inflammation of the trunk of the nerve (perhaps involving chiefly the sheath) within the Fallopian canal, and there is no evidence that inflammation ever involves the nerve after its emergence from the canal." This seems to dispose of the old theory of irritation of the peripheral nerve endings and also of the commonly accepted notion of a neuritis at some part of the trunk external to the stylo-mastoid foramen.

How shall we then explain the action of cold in the production of facial paralysis? It seems to me a very simple matter if we but consider the anatomical relations of this nerve and bear in mind the very great frequency of acute or sub-acute otitis media following exposure to cold. It is an extremely common occurrence to hear persons who are suffering with a mild naso-pharyngitis complain of slight involvement of the ear, that is, a sense of stuffiness in the ear, perhaps accompanied by some deafness, and even at times a moderate degree of pain. These symptoms, evidence of a mild sub-acute otitis, pass away in a short time with the other features of the cold and no serious damage is done, but suppose such a condition in an individual whose facial nerve is exposed in its course through the middle ear, how much greater are the chances of a serious lesion?

As a matter of fact, dehiscence of the Fallopian canal in the tympanum is a very frequent anatomical condition; the upper half of the eminentia pyramidalis, a part of the canal wall, is under ordinary circumstances very thin and often presents deficiencies, so that it is not at all uncommon for the facial nerve sheath to lie directly in contact with the mucous membrane of the middle ear. Then, too, Zuckerkandl has called attention to the normal existence of a small foramen in the canal wall just above the oval window for the passage of a branch of the arteria stylo-mastoidea to the stapes. With an exudate in the tympanic cavity here is an excellent opportunity for direct extension of the inflammation to the nerve sheath, or, for the exercise of the baneful influence of pressure upon the nerve, and in this connection we must not overlook the differences in width of Fallopian canals, inasmuch as an exudate in a canal with narrowed lumen would produce paresis more easily than in a wide one.

The usual history of a facial paralysis occurring without any other apparent lesion in an otherwise normal individual is, that the patient having contracted a cold finds himself four or five days later, often earlier, with a drawn mouth, lagging eyelid, and soon, more or less complete inaction of the facial muscles of one side. He may or may not have had prodromic symptoms but, if he has, these generally consist of a pricking or stinging pain in the ear with a sense of stuffiness, slight deafness and tinnitus, following the ordinary symptoms of a cold in the head or sore throat, and preceding the first evidences of any trouble with the muscles. The ear symptoms are apt to be mild and sometimes attract so little attention that when the patient has become absorbed in the consideration of his more alarming condition, the

[1] Read before The Johns Hopkins Medical Society, December 2, 1901.

facial deformity, he forgets and, unless closely questioned, makes no reference to the previous ear trouble.

As illustrating these cases I might relate briefly the history of one which is typical of a series of four that I have personally observed.

Mr. T. W. McC. was brought to me for consultation by Dr. Clement A. Penrose on August 29. Five days previously he had first noticed signs of a right facial paralysis. He had been suffering slightly from a cold in the head accompanied by some pain, though not severe, in the right ear. There was no ear-ache at the time of his visit to Dr. Penrose but pressure over the mastoid elicited some tenderness along the anterior border of the process and over the antrum. The tympanic membrane was not congested but there were indications of fluid in the tympanic cavity.

A paracentesis was suggested and performed later in the day. When the membrane was incised there was a distinct ripping sound, heard by all in the room, like the cutting of parchment paper, showing that the membrane was on the stretch and under considerable pressure. This was followed immediately by the escape of several drops of serous fluid. A sterile cotton wick was inserted and the next morning this was found to be saturated with serum; the mastoid tenderness had diminished markedly and there was no pain, œdema or fever. No organisms were found. On the following day improvement in the paralyzed muscles began. The free discharge of serous fluid continued but at no time was there any appearance of pus. On the 29th the paralysis was complete on the right side, even of the orbicularis palpebrarum and the occipito-frontalis; August 31 he was able to close the upper lid to the lower edge of the pupil; September 1, upper lid margin could reach lower border of cornea and there was some movement of the brow; and by September 9 he had regained almost complete control of facial muscles. The discharge ceased within a few days and the perforation was almost healed when he left the hospital.

There can be, I think, little doubt that this was a case of mild pharyngitis, followed by a sub-acute otitis media, involving the mastoid antrum and perhaps other cells as well, which produced paralysis through the effect of the exudate upon the facial nerve in its course through the tympanum.

In support of this hypothesis I may bring up clinical evidence of a different character. It might be thought that as the majority of these cases get well in from one to four weeks without treatment, or under different forms of treatment, and at no time show any marked ear symptoms, that there is no good reason to suppose the middle ear involved. We know that the same good result is attained in the majority of untreated sub-acute middle ear catarrhs in which the nerve is not concerned and in either case the explanation is simple. In the more favored cases the exudate soon finds its way out of the tympanum through the eustachian tube and in the slower cases it is removed by gradual resorption; pressure relieved, the irritation of the nerve subsides and the muscles recover their function. Furthermore, the treatment found to be best adapted to the cure of these cases is very suggestive of a relationship between the paralysis and middle ear disease. That which seems to have been agreed upon by all authorities as most beneficial is: the application of leeches over the mastoid, counter-irritants behind the ear, purgatives, and potassium iodide internally. These are precisely the remedies of most value in removing inflammatory products from the tympanic cavity—except where instruments may be employed.

The fact that I had, in my very limited experience, seen four cases of facial paralysis in which the middle ear was involved in a mild catarrhal inflammation just prior to the onset of paretic symptoms and which presented coincidentally a collection of fluid in the tympanum, the evacuation of which permitted prompt and rapid recovery of muscle power, led me to think that this pathological process might explain most, if not all, of the cases ordinarily described as "due to cold." I find that this point was suggested, however, as long ago as 1857 by Berard, and by Deleau, and that since then cases have been reported to illustrate this relationship by several writers. Tomka, in a very excellent article dealing fully with the subject of facial paralysis, in the Archiv f. Ohrenhlk., April, 1900, emphasizes this point and reports other cases. The matter seems to have been generally ignored though and the indefinite statements of the numerous text-books excuse me for making this communication. This class of cases is of course rarely seen by the otologist and, unfortunately, the ear is very rarely examined by the family physician.

Now a word as to the bearing of all this on the treatment of facial paralysis. Admitting the natural tendency of the affection towards recovery and the beneficial influence of such treatment as has been referred to, we must still ask ourselves whether we can do anything more to hasten relief from the disability. I believe we can. If it be found that there is an exudate in the tympanum, the sooner it is removed the more rapid will be the recovery and, on the other hand, the longer it is allowed to remain there the greater will be the danger of permanent injury to the nerve. The easiest and quickest way to get rid of such an exudate is a paracentesis of the tympanic membrane and that is a simple and perfectly safe operation, not requiring any great amount of skill, and, if done under proper aseptic precautions, doing no harm even though it should be performed in a case where it was not needed.

The points I wish particularly to bring out then are these:

1. If exposure to cold, in one way or another, is the cause of most cases of facial paralysis, it probably acts most commonly through the production of an otitis media, whereby the nerve becomes involved either in a direct extension of the inflammatory process to its exposed sheath, or through pressure upon it of an exudate.

2. This being admitted, the form of treatment which offers the most rapid and satisfactory results is a paracentesis of the tympanic membrane to free the cavity of its abnormal contents.

3. We should never in any case of facial paralysis neglect to examine the ear.

A NEW METHOD OF TEACHING THE MACROSCOPICAL ANATOMY OF THE CENTRAL NERVOUS SYSTEM.[1]

BY ARTHUR P. HERRING, M. D.,

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We have recently introduced in the anatomical laboratory of the Baltimore Medical College what we believe to be a new method of teaching the macroscopical anatomy of the central nervous system.

The mother of invention, necessity, gave birth to this method. We have found it simply impossible to supply our large and ever-growing classes with sufficient neurological material to dissect. The brain from a cadaver cannot be hardened and consequently is useless for dissecting. We have to depend to a large extent on fresh bodies for our material; hence the supply is limited and precarious.

It is scarcely necessary for me to speak of the importance of practical laboratory work in the study of anatomy; especially is this true when one is studying the nervous system. There is nothing more conducive to knowledge than to actually work out the subject one is trying to master; on the other hand, there can be no doubt that the mere memorizing of facts in anatomy, presented almost entirely in lectures and text-books, furnishes the most certain means of forgetting them. The method I wish to speak of presents the subject to the student's mind in three different ways, stimulating his interest, and fixing his attention in such a manner that it is almost impossible for him not to understand his work, or forget it after once having learned it. After the student has finished dissecting (the head generally being the last part to be dissected) he begins the study of the brain by first reading over the subject in his text-book, and attending the lectures. He then studies the specimens contained in the glass cases (Fig. 1). These are prepared so that "he who runs may read." They are self-explanatory, each part of the brain being colored so that the student can locate the various structures without much difficulty. With each case there is a diagrammatic drawing, explaining the various colors. The cases (Fig. 2) were designed especially for this work and are made with heavy tin bottom and ends and glass sides and top. I wish to thank Dr. A. Tumbleson for valuable assistance in working out the coloring solutions for these specimens. They are made as follows:

Sol. No. 1. Make a thin syrup by dissolving brown shellac in alcohol.

Sol. No. 2. Dissolve refined caoutchouc in chloroform. Make a medium thick syrup.

Sol. No. 3. Take one part of No. 1 and add three parts of chloroform. This is done to thin the shellac and to prevent alcohol from precipitating the gum in No. 4.

Sol. No. 4. Add one part of No. 3 to two parts of No. 2, gradually stirring all the time. The solutions may be thinned with chloroform if necessary. They should be about as thick as honey. Then add the mineral colors, as chrome yellow, Prussian blue, raw umber, etc., and keep the solutions well corked. The brain is hardened in formaldehyde. The surface to be colored is thoroughly dried and the coloring matter applied with a brush. Allow this to dry and then immerse the specimen in preserving solution. This mixture forms a gummy covering, as it were, which does not penetrate the tissue, nor destroy the brain in any way, so that the same specimen may be used for other purposes, if necessary. The specimens are preserved in a weak formalin solution and last indefinitely.

After the student has finished studying these specimens carefully, and has formed some idea of the shape and location of the various structures, he then begins to mould the brain from his knowledge already obtained by the previous study, and now being put to a practical test (Figs. 3 and 4). Of course during this part of the work, students are allowed to refer to the original specimen and use every help necessary. It has been very gratifying to see the interest manifested by the students in this work. They all agree that after spending several hours in making a certain part of the brain, they are not apt to forget it very quickly. The advantage of this method is that it gives the student something tangible to work with. He does not have to form a mental picture of a structure he has never seen. It creates interest and enthusiasm, and as a result the student learns the anatomy of a part of the body generally conceded to be not only difficult, but ofttimes obscure.

[1] Read before The Johns Hopkins Hospital Medical Society, December 2, 1901.

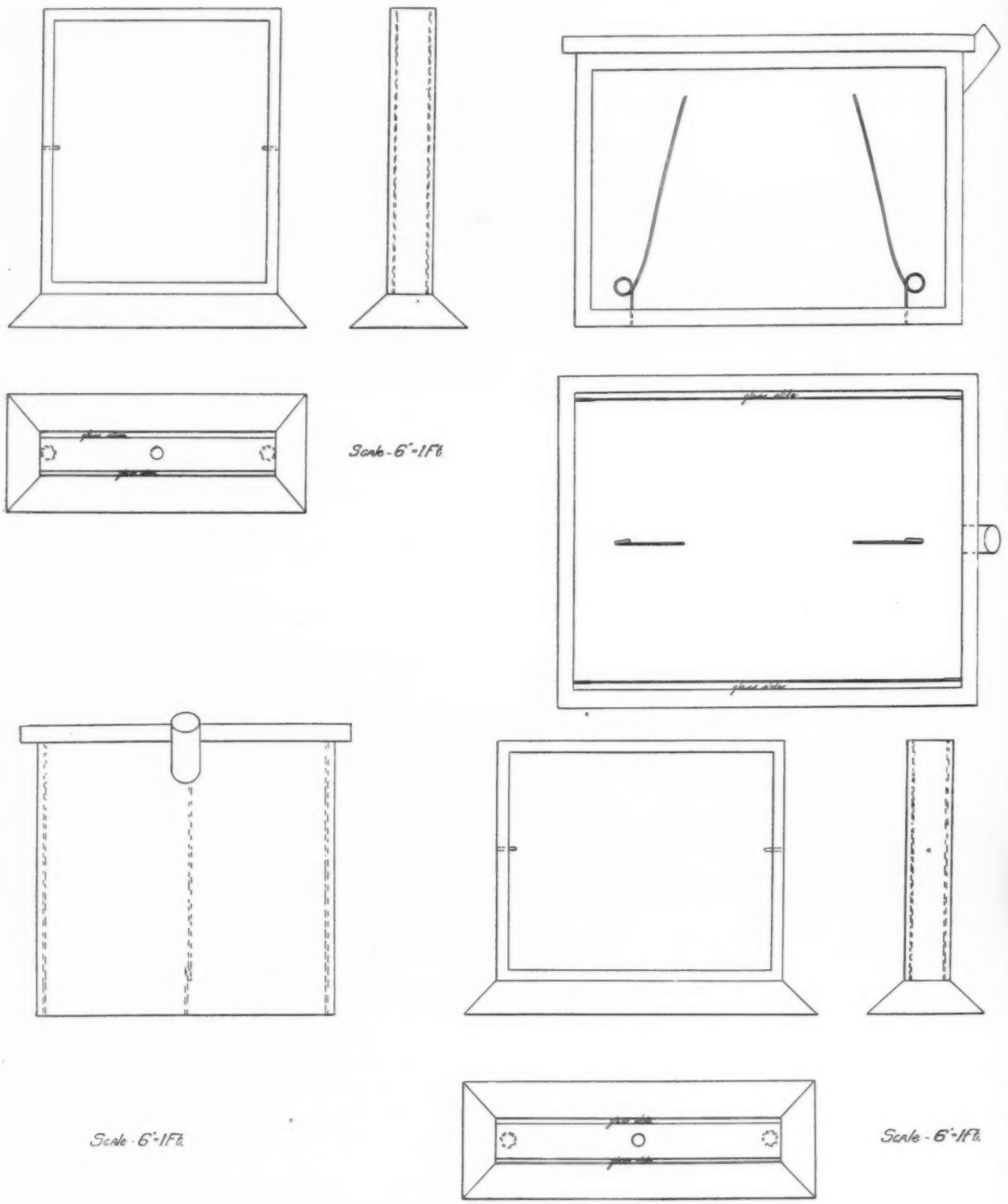

FIG. 2.—Working plan for making anatomical cases.

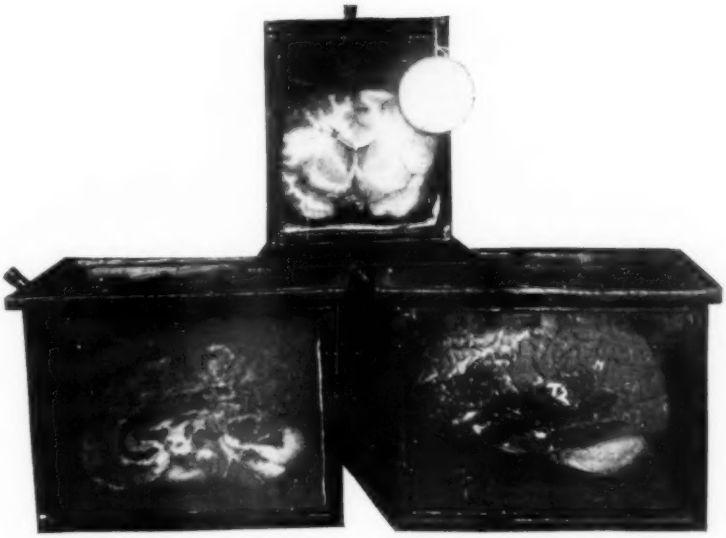

FIG. 1.—Brains preserved and colored for study.

FIG. 3.—Models of brains made from clay.

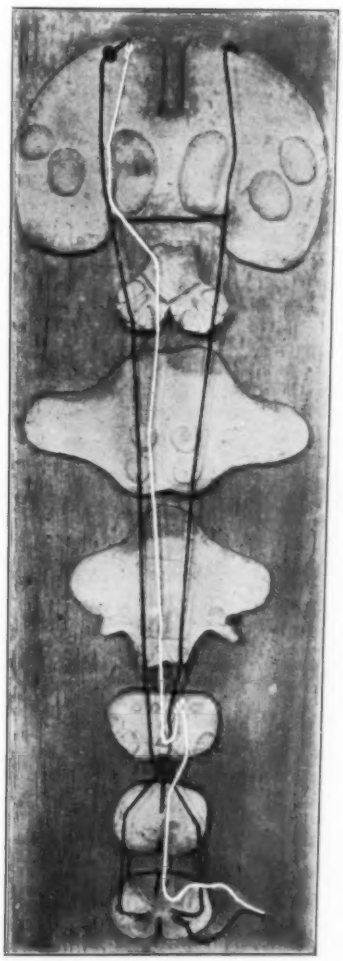

FIG. 4.—Diagram of the motor (black), and sensory (white), tracts of the central nervous system.

SORCERY, MEDICINE AND SURGERY IN ANCIENT MEXICO.[1]

By Zelia Nuttall.

We owe the greater part of our knowledge of native sorcery, medicine and surgery to the monumental work of Bernardino de Sahagun, a Spanish Franciscan friar of remarkable intellectual gifts, who went to Mexico soon after the Conquest and has left the most valuable work in existence on the customs and history of the Ancient Mexicans. An unpublished manuscript portion of this work preserved at the Royal Library at Madrid, where I studied and copied it in 1892, contains descriptions in the Nahuatl language of the various functions of what Dr. Seler of Berlin has rightly classified as sorcerers, fortune-tellers, jugglers and medicine-men.[2] A critical study of the passages relating to the so-called sorcerer reveals that his office was about the same as that of the "rain-maker" of the Pueblo tribes at the present day.

He is described as being a sorcerer, a prophet and one who can avert hail-storms. He knew the sky and the underworld, and could tell whether it would rain or not. He prophesied droughts and famines and directed the prayers and sacrifices which were to be made in order to avert these evils. He sometimes prophesied that frost was coming, or hail, or said: "in a year hence fire will fall upon us," a prophecy which in a volcanic country was probably associated with the idea of an eruption accompanied by showers of fiery ashes.

This type of prophet is described as a priest, who lived in strict seclusion in the temple and fasted. He alone had the power to protect the people from the evil sorcerers who, when animated by hatred, strove to destroy a village and its chieftain.

These evil sorcerers were generally named "tiacatecoloti," literally "owl-men," and are described as "those who do harm to others." It seems to have been the current belief that such a sorcerer could assume, at will, the form of an owl, and that by a mere look he could bewitch or "eat the life or heart of his victim." The sorcerer is finally described in the following text: "The man-owl, when he hates some one and desires his death, wounds him mortally and causes his possessions to be destroyed. He can make persons faint or become unconscious; he can cause darkness. Then he writes signs on the walls of the house. He wounds a person so that he lies down and then he wishes his death. But if any one can touch the sorcerer or seize him when he is in the house he becomes powerless and when dawn arrives he dies there, on the spot."

There were means, however, by which it was possible to protect a house from a sorcerer. A bowl of water, containing an obsidian knife, was placed behind the door or in the court-yard at night-time. When the sorcerer gazed into the bowl and saw his own reflection in it, crossed by the obsidian knife, he turned and fled and never ventured to return.

The power to rob their victims of consciousness is particularly ascribed to those sorcerers who, bent on robbery, made use of a potent charm, consisting of a dried human arm. These sorcerer thieves were known as the tomamacpalitotique, a name which is recorded, in the singular, in Molina's dictionary, as meaning "a thief who steals and robs by means of enchantments or sorcery."

The following translation of Sahagun's description of the mode of procedure adopted by the sorcerer-thieves has already been published by me in an article on "Ancient Mexican Superstitions," which appeared in the Journal of American Folk Lore, Vol. X, No. XXXIX:

"They always chose for the exercise of their calling a day bearing the numeral nine, united to certain calendar signs which were considered particularly auspicious. Having decided to rob and plunder a certain house, they formed a band consisting of fifteen to twenty fellow-sorcerers, and manufactured an image of a serpent or of the patron of necromancy, Quetzalcoatl, the "Feathered Serpent." They then set out and danced towards the house, "that is to say, they advanced in unison, with measured steps, such as were executed in some of the old sacred dances. One of the leaders carried the aforesaid effigy, whilst a second carried over his shoulder the left forearm and hand of a woman which, according to certain superstitious beliefs, was supposed to possess the magical power of depriving persons of their senses. In order to employ this against the inmates of the house, the thieves first halted in its court-yard and struck blows upon the ground with the dead hand and then knocked with it at the threshold or lintels of the entrances. It was said that the effect of these ominous sounds caused the inmates of the house to fall into a profound sleep or swoon, and that they could not move or speak and seemed lifeless, although they saw and heard all that was going on. Some, however, actually slept, and even snored; whereupon the thieves lighted their torches, searched the house for provisions, and proceeded to enjoy a tranquil repast, the rightful owners observing them, spellbound. The robbers then ransacked the dwelling, took possession of every article of value it contained, tied these in bundles, and after committing other misdeeds, decamped and ran to their respective homes, laden with their booty. None of them rested on their way home; for it was said that if they did so they lost their power to rise again, and, being held spellbound until morning,

[1] Read before the Annual Meeting of the Baltimore branch of the American Folk-lore Society, April 26, 1901.

[2] In an article published in 1899, entitled Zauberei und Zauberer im Alten Mexico (Veröffentlichungen aus dem Kgl. Museum für Völkerkunde, Berlin), Prof. Ed. Seler published a good translation into German of the above mentioned portion of Sahagun's MS.

could be seized with their spoils and forced to betray their accomplices. In Dr. Otto Stoll's valuable and suggestive work on the rôle of suggestion and hypnotism in the history of psychology, he points out that the symptoms described above as produced by the talismanic knocks, are identical with those of suggestive catalepsy, aphasia, and hypnotism by suggestion. It can well be imagined that the mere fact of being aroused, under such terrifying circumstances by sounds proceeding from a talisman reputed to rob persons of the power of motion, may well have induced the conditions indicated by Dr. Stoll."

Sahagun also gives the following quaint version of a curious mode of enchantment employed by the native sorcerer named: "The setting up of a person in the fire." When the sorcerer has been much angered by any one and hates him, he makes his image in the form of a mummy and sets it up. He surrounds it with staffs decorated with paper flags. During four nights he manufactures these. He prepares food offerings and places them before the mummy, which he then burns during the night. He invites his victim to visit him at dawn and gives him the food offering which had been placed before the mummy. Whilst his guest eats it the sorcerer utters the words: "may you die soon."

In the same way "when a sorcerer has a grudge against a village, he goes to it and wanders about in the temple, in the house of the chieftain and of the people, wishing in his heart that all might be destroyed. When war breaks out he wishes that all may die in battle, and that the village may be converted into ashes. But when he is found out, when he is discovered, then he dies by the hand of the people then and there, or in his own house." It is evident from this that just as among the Pueblo Indians of the present day, an individual suspected of sorcery was exposed to losing his life. Sahagun also relates that there was a certain class of sorcerers who are called the "snake sorcerers or charmers," or "he who infuses life into snakes." These were consulted when any one had lost some property and suspected that it had been stolen from him. The following is a verbal rendering of Sahagun's quaint text:

"The sorcerer or snake charmer (who seems to have been somewhat of a juggler) was consulted in cases of theft. The complainant assembled the neighbors whom he suspected of having robbed him and the sorcerer made them all sit in a row on the ground. When all were assembled in the house he admonished them saying, 'My children, you are seated here because your neighbor is in trouble and because in my absence and in your absence some one has robbed him of his belongings. The guilty one had better return the stolen goods at once, because the sorcerer is now here and is about to identify him.'

"If, upon this, no one speaks and confesses his guilt, the sorcerer removes the lid of a bowl. When he has done this and has charmed the snake which lies in the bowl, it crawls out and looks around in all directions. It perceives the persons seated on the ground and looks at them, one after the other. Then it crawls forward and confronts the people. When it recognizes the person who has stolen the goods it crawls upon him and lies on him. Then the others seize the guilty one and bind him and he confesses his guilt.

"If the snake sees no guilty person it returns to the bowl, coils up and quietly lies in it.

"In the latter case it was regarded as proven that there was no foundation for suspicion. The man who had been robbed just quieted himself and was satisfied."

The anonymous Hispano-Mexican MS. I discovered at the Biblioteca Nazionale Centrale in Florence and am about to publish under its title, "The Life of the Mexican Indians," contains an interesting illustration of what the text describes as "a kind of diabolical medicine which was practiced by the Indian women doctors."[3] It will be seen from the following text that this so-called diabolical rite was really no more than an attempt at prediction or "fortune-telling."

"When some one was ill they called the medicine woman or man in order to ascertain how the illness would end, and placed an idol in front of the patient. This idol was named Quetzalcoatl, or 'Plumed serpent.' A mat was laid upon the floor and the medicine woman placed herself on this and spread a white cotton cloth. She then took twenty grains of maize in her hand and cast them upon the white cloth, just as the Spaniards cast dice. If the said grains fell in a circle, leaving an empty space in the center, it was a sign that the patient would die of his illness and would be buried —the empty space being regarded as the sign for a grave. If the grains fell on top of each other it signified that the illness had been caused by sorcery or witchcraft, but if, in falling, the grains divided into two parts, one-half being on one side and one on the other, so that a straight line could be drawn through the middle of the group without touching a single grain, it was a sign that the disease would leave the patient and that he would recover."

After the preceding quotations, which afford a curious insight into the lives of the Mexican people shortly after the Spanish Conquest, let us now consult Sahagun's work about the medicine-men of ancient Mexico. One kind of medicine-man was designated as "he who takes something out of a person." The text reads: "When any one is ill he is called, so that he should remove the illness. He first chews a bitter herb named iztauhiati, sprinkles its juice on the person and rubs him over with it. Then he feels him all over. Wherever he finds a sore spot he removes from the flesh a pebble or an obsidian knife, a roll of paper or a splinter or something else. After he has done this some persons get well—others do not."

In the sacred books of the Quichés a historical medicine-man is recorded as stating that he "drew worms from the teeth or from the eyes."

Another class of healers is separately described as "he

[3] In Prof. Seler's article cited above, he published an unauthorised translation of this text, thereby anticipating my publication, the appearance of which has been unfortunately unavoidably delayed.

who sucks out illness," and the text relates: "When a child has a sore chest the sorcerer uses the herb iztauhiati, and sucks out blood or matter. Some children get well. Others do not."

An extremely curious mode of treatment for children is also given by Sahagun. "The child patient, or the patient child, was held head downwards and its head was shaken to and fro, its mouth being pressed close or stopped with cotton-wool. Of this prescription it may be surmised that some may have recovered, but that the majority did not."

While the above records appear to show that the medicine-man of ancient Mexico was identical with the North American Indian medicine-man of the present day, other details preserved show us that they also possessed remarkable knowledge of the curative properties of the native herbs. Indeed, old Spanish writers repeatedly refer to the remarkable knowledge of the medicinal properties of the native plants, possessed by the Mexicans and it is well known that, near Montezuma's palace, there was a garden in which medicinal herbs from all parts of the country were cultivated, for the use of the population of the City of Mexico.

The Mexican medicine-man had, moreover, likewise discovered the properties of certain plants and employed them as stimulants, in order to produce hallucinations, visions and ecstasy in connection with their religious rites.

We find that the native tobacco was used in this way. Its leaves were bruised and mixed with some alkaline substance such as lime or with charcoal. This paste was then formed into tiny pellets which seem to have been chewed or eaten and were carried by the priests in a small gourd or calabash, suspended from their necks. In the form of pellets tobacco was called "ye-qualli," "tobacco food," was designated as a "strengthener or sustainer," and, like the coca of Peru, was used by those who set out on long, forced marches.

Dr. Seler, of Berlin, suspects that tobacco also formed the main ingredient of the so-called "divine food" employed by the Mexican priesthood which is described by Duran as having been a strange compound of all sorts of ingredients, such as dried and pulverized spiders, scorpions, etc.

While it thus appears that the ancient Mexicans principally chewed tobacco, we also know that they smoked it. In this case it was, however, prepared with great care and mixed with fragrant substances. The paste thus formed was introduced into a hollow reed, one end of which served as a mouth-piece. It was one of the refinements of ancient Mexican life to offer such "reed-tobacco" to guests, on small painted terra-cotta trays. We are informed that these fragrant reeds were usually smoked after banquets, and were considered a great luxury.

Whilst the ancient Mexicans thus appear to have made good use of the native weed, they also seem to have made an extremely intelligent use of other native products. Thus, in the treatment recommended for the preservation of the teeth, for toothache and inflamed gums, we find that charcoal and the capsicum were used for the same purposes as in modern dentistry.

The following prescription for the alleviation of inflamed gums is a curious mixture of ignorance and practical common sense. I shall give it to you in literal translation:

"Inflammation of the gums is cured by lancing them with an obsidian knife and rubbing in a little salt with the finger. For toothache it is necessary to look for a certain kind of maggot and to grind it with some resin from the fir-tree. This is to be applied to the gum. Then heat a red-pepper or capsicum and press it and a grain of salt as tightly as possible upon the painful spot. Then lance the gum and apply a certain herb called tlalcaoatl. If these remedies do not suffice, draw the tooth and put a little salt into the hollow place."

It is certainly interesting to find, in ancient Mexico, the employment of the primitive type of the modern capsicum toothache plaster and to realize that centuries of experience had taught the natives the value of the capsicum as a counter-irritant and of salt as an antiseptic.

It is likewise interesting to find the following cautionary paragraph in the old manuscript: "In order to avoid the above disease of the teeth it is well to avoid eating very hot food. If hot food is eaten, do not drink very cold water immediately afterwards. Always clean the front and back teeth after eating, also employ a wooden toothpick. Use cold water and salt for cleaning the teeth and rub them frequently with a cloth and some finely ground charcoal."

It is well known that the ancient Mexicans placed the highest value on the temazcalli or sweat-house as a curative agent, and I find it prescribed for all kinds of illnesses. It was resorted to by mothers immediately before childbirth, a custom still adhered to by Indian women in various parts of Mexico. The sweat-house was associated with the cult of the "earth-mother," the "grandmother of all," and many superstitious rites were associated with its use. The disapproval with which it was consequently regarded by the Spanish missionaries gradually restricted its hygienic usefulness. Its employment was accompanied by an intelligent use of massage, and we find that various forms of massage treatment were prescribed after the sweat-bath. Thus: "a swollen neck or sore throat is to be rubbed with the hand. A stiff neck or shoulder is to be pinched and squeezed." For a cough, however, the throat is to be rubbed with a finger only.

"Sprains are to be treated by rubbing very gently with the hand."

The treatment for headache is somewhat more heroic: "Smell a certain herb named ecusco, or the pepper plant when it is young and green. Tie up the head with a cloth and inhale the smoke of certain different kinds of incense. If the headache should get worse, pulverise the dry leaves of a certain herb named cocoiatic and use it as a snuff. If, however, the pain increases take some drops of the juice of a certain plant, mix these with a little water and sniff it up

the nose. If, after this, the pain is not allayed, take an obsidian knife and lance and bleed the head."

An insight into the mode of treating wounds is afforded by the following directions: "Wounds or cuts of the lip are to be sewn up with a human hair and then bathed with the juice of the agave plant. If, after the wound has healed, it leaves an ugly mark, it is necessary to re-open and burn it and sew it up again with a hair and cover it with melted ulli, that is to say, the juice of the India-rubber plant."

A peculiar mode of treating wounds is described by Friar Sahagun in a chapter devoted to the medicinal use of different stones, but I strongly suspect Spanish influence in these cases. It is, however, interesting to learn what ideas were prevalent amongst the Spanish missionaries in Mexico, about the year 1570.

had experience of the virtue of this stone, because I possess one which is about as large as a fist and is rough and uncut, just as when broken from the rock. In the year of 1576, during the pestilence of nose-bleeding, this stone saved the lives of many who, as the Chronicle quaintly says, "*were losing their blood and their lives through their noses.*" "On taking it into their hands and holding it tight for a while the nose-bleed ceased and they were cured of this disease of which many have died and still die in New Spain." The friar concludes with the statement that in the village of Tlatelolco of Santiago, there were many living witnesses of the above remarkable cures.

From Friar Sahagun we learn that, in cases of fractured bones, splints, made of pine wood, were used by the native surgeons. In conclusion, I will mention the existence, in

FIG. 1.

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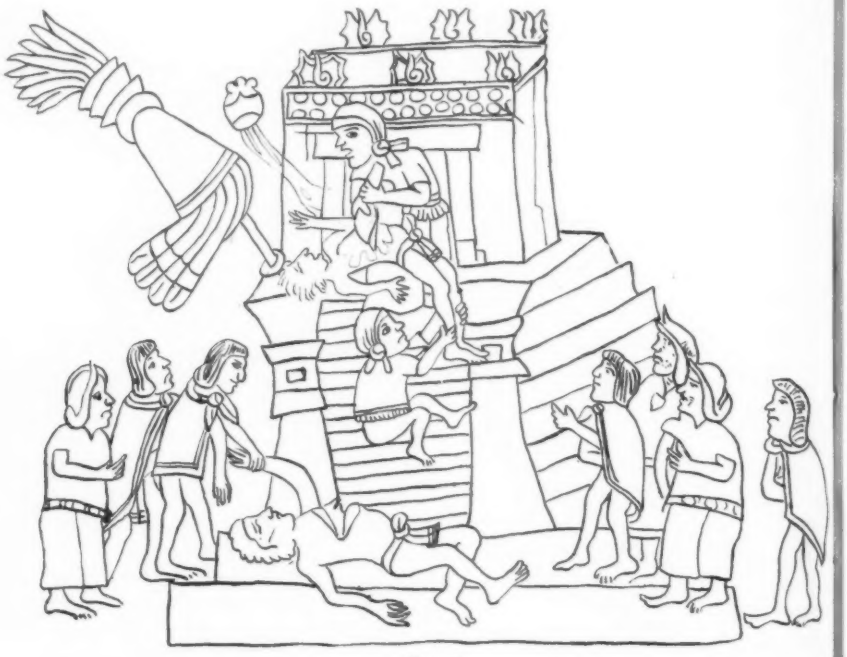

FIG. 2.

Anonymous Hispano-Mexican Manuscript Entitled "The Life of the Indians," preserved at the Biblioteca Nagisuale Centrale, Florence, p. 58.

After describing the different kinds of obsidian the friar adds: "I believe that this stone is a kind of black emerald, as experience has taught me that it possesses particular virtues. When ground to a powder as fine as flour, and applied to open wounds or sores, it cures them very quickly and prevents festering."

"Catarrhs are cured, the voice is rendered clear, and internal heat is abated by taking two or three pills made by mixing powdered obsidian with quince cheese or some other thick preserve which absorbs a great deal of the powder." The friar states: In this country the blood-stone is also found, and it is green, with what look like drops of blood. This stone has the virtue of stopping the nosebleed. I have

ancient Mexican codices and manuscripts, of representations of two kinds of what we shall call, by courtesy, surgical operations.

One of these consists of the ceremonial piercing of the nostril of a warrior by an ancient Mexican priest, in order that he may wear the turquoise nose ornament, which was the equivalent to the Victoria Cross in Montezuma's time, and a mark of highest rank.

The pictures represent the warrior on the pyramid temple, resting his head on a kind of stone altar, while the high priest is piercing his nostril with the sharp point of an agave leaf (Fig. 1).

The second operation is that which was performed by the

high priest when sacrificing the lives of animals or human beings in the temples, and constitutes the most repulsive feature of ancient Mexican life. The native chronicles relate that the ritual sacrifice of human beings had only been in use for a comparatively short period in native history and had been adopted by the fierce Mexicans for the purpose of intimidating the tribes which they subjugated and forced to yield tribute. An extenuating circumstance is that only prisoners of war, slaves or criminals were thus sacrificed. Friar Duran gives a graphic description of the rite. The victim who had been drugged and was in an almost unconscious condition was placed with his back resting on the summit of a high conical stone. Assistant priests held his limbs and pressed them downwards, which caused his chest to protrude and to be at a high tension. The head priest then made a deep incision with a large flint knife which, as Duran crudely states, "caused the victim's chest to open like a ripe pomegranate." The priest then inserted his hand in the opening, seized the victim's heart, tore it out and held it aloft (Fig. 2).

A summary of the foregoing material seems to show that, whereas the ancient Mexicans had rain-makers and medicine-men, whose professional attainments were on a par with those of other American tribes of the present day, they also possessed an excellent knowledge of the hygienic uses of the sweat-house and massage and of the medicinal properties of various plants, and natural products, and put some of them to sensible and practical uses. Besides having acquired, through experience, a certain rudimentary knowledge of surgery, they also practiced upon human and animal victims by means of a stone knife, a form of operation which, although peculiar and extremely repulsive, appears to have been methodical and effective and to have demanded a certain amount of surgical skill and practice.

Note.—Original sources referred to: Fray Bernardino de Sahagun, *Historia General de las cosas de Nueva-España*, ed. Bustamante, Mexico, 1830, unpublished original texts. Fray Diego Duran, *Historia de las Indians de Nueva-España*, ed. Ramirez, Mexico, 1867. Fray Geronimo de Mendieta, *Historia Eclesiastica Indiana*, ed. Icazbalceta, Mexico, 1870.

PRELIMINARY NOTE.[1] THE EXTENT OF GASTRIC DIGESTION IN CASES OF CARCINOMA OF THE STOMACH.

By Charles P. Emerson, M. D.,

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(*From the Clinical Laboratory, Basel, Switzerland, Prof. Fr. Müller, Director.*)

At the suggestion of Prof. Müller a series of gastric contents were analyzed to ascertain if anything characteristic could be discovered in the progress of digestion in cases of carcinoma of the stomach, hyperacidity, and anacidity.

It has been recently shown by the Strassburg School that zinc sulphate may be used instead of ammonium sulphate to separate the various albumoses, hence the amount of albumoses in each fraction may now be easily determined by estimation of the nitrogen present. Using this method Zunz has shown that the chief end product of peptic digestion was not peptone, but that very early, even before any peptone was present, a considerable amount of nitrogen was in bodies between peptone and the amido acids (Pfaundler). This being the case, it is a point of considerable interest to ascertain if the per cent of nitrogen in albumoses, peptone, and these further bodies shows constant variations from normal in different diseases, especially carcinoma of the stomach, and whether these variations may be used in the early diagnosis of these diseases.

The method used is briefly as follows: a test meal, either the Ewald test breakfast, or, better still, fifteen grams of nutrose in four hundred ccs. of water, is given, and removed in one hour. The nitrogen of the neutralized and filtered gastric content is first determined; the proto-albumoses are precipitated by half saturation, the deutero-albumoses by complete saturation with zinc sulphate; the peptone is precipitated by phosphotungstic acid, but since this reagent precipitates many other bodies also the term "P. W. precipitate" will be used instead of "peptone." The nitrogen of the filtrate after each precipitation is determined and thus the amount removed in the precipitate easily reckoned. The nitrogen in bodies precipitated neither by zinc sulphate nor by P. W. acid will be referred to as "nitrogen remaining." The results of these analyses is very interesting. In all conditions considered together except carcinoma the nitrogen was distributed approximately as follows: primary and secondary albumoses, 51.5 per cent; P. W. ppt., 31.4 per cent; remaining, 17 per cent. In carcinoma of the stomach, however, the figures were respectively, 25.22 per cent, 47.04 per cent, 27.74 per cent. That is, in carcinoma the digestion is more advanced, more of the nitrogen being present in those bodies beyond the albumose stage, than in the normal, hyperacid and anacidic stomachs.

This would confirm the opinion formerly held by Prof. Müller that in the carcinomatous stomach the carcinoma itself furnishes a ferment which aids in the peptic digestion. If this be the case, we should expect to be able to demonstrate its activity in artificial digestion mixtures. To show that

[1] Read before the Johns Hopkins Medical Society.

we can do this I give the results of one of my experiments on this point.

Two artificial gastric juices, consisting of water 500 ccs., hydrochloric acid (sp. gr. 1.124) 2 ccs., pepsin (Witte) 1.5 ccs., were made. To each was added fibrin 10 gms. To one, mixture A, was added 5 gms. of carcinoma tissue; to the other, mixture B, 5 gms. of the same carcinoma tissue which had been heated to 80° C. Tolnol was added to prevent bacterial growth. Analysis at the end of a few days in the thermostat at 40° C. showed:

	Mixture A	B
N. in albumoses	17.3 per cent	30.7 per cent
N. in P. W. ppt.	59.8 per cent	56.1 per cent
N. remaining	22.9 per cent	13.2 per cent

Hence the presence of unheated carcinoma tissue in mixture A has resulted in a more advanced digestion than in mixture B. Similar results were obtained by experiments modified in various ways, omission of the pepsin and fibrin, of the fibrin, etc.

The recognition of the presence of a ferment supplied by the carcinoma will explain the early absence of free HCl in that disease, as the work of Stehelen on the bases of the gastric juice in carcinoma of the stomach, and of Rosenburger on the disappearance of free HCl from artificial digestive mixtures to which carcinomatous tissue has been added, both working under Prof. Müller's direction, will show.

In conclusion, I take the opportunity to emphasize the advantage of using nutrose or some other simple albumin as the test meal in such work. Nutrose is a fairly pure casein preparation, is easily given (10-15 gms. in 400 ccs. water well salted or flavored with some non-nitrogenous substance), is easily removed, but what is more important, casein is more slowly digested, hence one can easily see variations in the progress of digestion.

A complete report of work on this subject thus far done will very shortly appear. The work is being continued with reference to the effect of various therapeutic measures on the digestion in cases of subacidity and hyperacidity, and especially to prove the value of the above point in the early diagnosis of cancer of the stomach.

Discussion.

Dr. J. C. Hemmeter.—The report impresses me as a resumé of the hypotheses attempting an explanation of why the carcinomatous stomach contains less hydrochloric acid than the normal stomach, and, then, an effort to establish one of these explanations on a more solid basis by chemical investigation. It is unfortunate (for the theory that the neoplasm gives rise to something which neutralizes the secreted HCl) that the carcinoma which originates from a gastric ulcer always has an excess of hydrochloric acid and yet, according to Hauser, it presents the architecture of typical carcinoma. It is an established fact that the excess of hydrochloric acid which is characteristic of gastric ulcer continues while the disease degenerates afterwards into a carcinoma. Then, too, it makes a great difference where the carcinoma is located. Hydrochloric acid is a product of well-defined histological elements in the peptic ducts, as proven by Langley, and Mall and Heidenhain. These oxyntic cells are limited to a particular zone in the stomach. If the carcinoma should originate where there are few of these cells it is logical to presume that it would not interfere so much with the formation of hydrochloric acid, as it would in a location where the oxyntic cells are normally abundant. So we are justified in considering that the explanation of absence of HCl in carcinoma rests upon this histologic basis, rather than upon the hypothesis that the carcinoma produces something by which the HCl is neutralized. Dr. Emerson has stated that the digestive experiments made with contents of cancerous stomachs carry the solution of proteids a little further than the normal stomach. It seems to me it is a too sweeping statement for there are carcinomatous stomachs that secrete no hydrochloric acid whatever, nor any trace of pepsin or rennin, nor the prozymogens of these ferments, and it is manifestly impossible for any proteolysis whatever to take place in such stomachs, excepting that due to bacteria.

I would like to ask if he has made any digestive experiments in which the contents were passed through a Pasteur filter, for it must be remembered that bacteria may play a very important part in these artificial digestion experiments, and bacterial proteolysis is considerable.

NOTES ON NEW BOOKS.

The Thirty-Second Annual Report of the State Board of Health of Massachusetts. (*Boston: Wright and Potter, 1901.*)

This report shows the work of the board for the year ending September 30, 1900. No changes in the membership of the board itself occurred during this year and the principal officers of the board also remained the same. The secretary of the board is Dr. S. W. Abbott; the engineer, Mr. X. H. Goodnough; the pathologist, Dr. Theobald Smith, the (food) analyst, Mr. A. E. Leach; the (water and sewage) chemist, Mr. H. W. Clark; and the consulting chemist, Dr. Thomas M. Drown president of Lehigh University; all men of the highest standing in their respective fields.

The general report points out a striking increase in the total death rate of 1900 as compared with that of 1899 (18.24 per thousand against 17.40), and a great increase in infectious diseases. Thus, in 1899, 5855 cases of diphtheria were reported from twenty-six cities. In 1900, the same cities showed a total of 10,861 cases of this disease. Of eleven infectious diseases listed, five showed a decrease in deaths aggregating only eighty-seven, while the other six showed an increase in deaths aggregating fourteen hundred and eleven.

Smallpox.—During 1900 there were 104 undoubted cases (1899 showed 105), but in addition to these, 174 cases of doubtful diagnosis amongst which no deaths occurred were reported from New Bedford.

Statistics relating to the protection afforded by vaccination

are given, which are of interest in the face of the recent, almost pandemic, outbreak. One cannot but believe, in view of this and much similar evidence, that those who persistently oppose and evade vaccination, often by underhand measures, the garbling of evidence and even the outright manufacture of falsehood, must be misled, malicious or monomaniac.

Typhoid Fever.—Shows a slight decrease for the five year period ending 1900, the rate for this period being 2.4 per ten thousand inhabitants, against 3.2 for the previous five-year period.

Consumption.—Continues the fairly steady decrease heretofore shown, reaching 18.5 deaths per ten thousand in 1900.

Diphtheria.—Has already been referred to.

Alleged Increase in Cancer.—Investigation begun by the board on this subject has resulted in an exhaustive statistical report made by Dr. W. F. Whitney, who finds, in brief, that the increase is rather apparent than real and probably due to better diagnosis and registration, not to truly greater prevalence.

New Legislative Acts.—Of these, one forbidding the taking of shellfish from contaminated waters, and another, making the addition of preservatives to foods adulteration, are of interest as bearing on subjects recently much under discussion.

Spring Waters.—Notwithstanding the fact that Massachusetts has probably expended more time, energy and money on public water supplies than has any other State in the Union, over 91 per cent. of the population having access to such supplies, private owners of spring waters find ready sale for their special commodity. Over $300,000 is spent annually by citizens of the State in this way. This is probably partly due to the fact that the surface waters of the State in general are more or less colored, during certain seasons of the year at least. In towns thus supplied, as well as in those where occasional bad odors or tastes (usually algal in origin) occur, the sale of spring water is highest. The board analyzed 99 of these spring waters; many of them proved excellent but in other cases, sewage contamination, old or recent, was quite evident.

Water Supply and Sewerage.—Much matter is given showing the advice of the board to many cities and towns regarding present or prospective systems, and the results of the analyses, chemical and microscopic, of the public water supplies now in use.

Lawrence Experimental Station.—The work on sewage purification was directed to the further investigation of rapid methods of filtration, the handling of manufacturing wastes and certain problems relating to the septic tank. The conclusions arrived at seemed to be rather indefinitely stated.

Mr. Gage, biologist at this station, contributes a very interesting paper on actual tests of the efficiency of filters for each of various common species of bacteria; the persistence of *B. coli* and *B. typhi* in the filters after their application to the filters has ceased; and the comparative degree of purification achieved for bacteria in general, for *B. coli* and for *B. typhi*. Mr. Gage's results in brief were as follows:

The efficiency for each of various common species varied but little from the average general bacterial efficiency.

With an average general bacterial efficiency of 98.72 (filter 68) and 98.82 (filter 69), the *B. coli* efficiency was 99.86 and 99.81 respectively, the *B. typhi* efficiency 100 and 99.92 respectively.

B. coli persisted, after its application to the filter ceased, for two days in one case, seven days in the other.

B. typhi disappeared from the effluent of both filters promptly when application ceased.

B. coli appeared in the effluents more frequently than *B. typhi*, under approximately parallel conditions.

For these reasons and others, it is probable that *B. typhi* is a less hardy plant than *B. coli*.

On page 446, the presence of *B. coli* in the effluent of a filter as an indication of the harmfulness or innocence of the effluent is discussed in some detail. The tentative conclusion reached is that *B. coli* in such an effluent is not necessarily of serious significance.

Bacteria in Ice.—In 1888-89, the board began an investigation of certain Massachusetts ice supplies but were hampered in finishing the work by an almost total failure of the ice crop in the succeeding year. The subject was taken up again in 1899 and 1900 with results which tend to show that the carriage of infection through ice on theoretical grounds is not to be much dreaded. This conclusion was reached from experimental consideration of the physics of freezing in natural and artificial ice. The crystallization tends to throw out of the ice, as it forms, substances, both in solution and in suspension, present in the water. Ninety per cent and upwards of the bacteria in the water are thus thrown out physically, when ice freezes from the top and not entirely to the bottom. Should the ice "freeze solid" to the bottom, as in shallow ponds or in artificial manufacture, the bacteria expelled from the first ice formed would of course be included in that formed at the end of the process.

Two other factors of safety in preserving ice, natural or artificial, from bacterial infection of sanitary significance, elucidated by the work of Winslow and of Park, were not given, the writer thinks, sufficient weight in arriving at the conclusions. These factors are (1st) the dying out of typhoid bacilli in the water at the temperature just above 0° C. necessarily preceding freezing, to the extent of not less than 90 per cent of the total number in the water originally, and (2nd) the dying out of typhoid bacilli in the ice itself, also to the extent of not less than 90 per cent of the numbers actually included in the ice, within a short time after freezing. Thus, one million typhoid bacilli per cc. introduced into a pond on the point of freezing would be usually reduced to 100,000 before any ice which could include them would be formed. Of this number but 10,000 would escape physical expulsion from the ice and only 1000 of these would survive twenty-four hours' sojourn in the ice itself. This degree of purification, 99.9 per cent, is as high as that attained by the best sand filter in existence. Moreover, this figure is calculated on the basis of 90 per cent reduction at each stage. Inasmuch as much higher degrees of reduction are often attained especially if the time limits be prolonged, as they usually are, where natural ice is in question, it is easy to see that the possibilities of infection through ice even under conditions favorable to such infection are very slight. It is scarcely too much to say that a deliberate attempt to introduce typhoid fever into a community through the medium of a natural ice supply would usually fail of its object. If this be true, infection occurring without deliberate aid can rarely exist.

Food and Drug Inspection.—Mr. Leach continues in the report of his department for this year the excellent plan, pursued in one or two previous reports, of describing in detail the methods used both chemical and microscopic. He adds a special report on the distribution of arsenic in wall papers, dress goods, etc., and also on the presence of chromium in black stockings. Several cases of poisoning from these sources were traced by the board. The presence of arsenic is usually associated in the lay mind with green colors because it was at first much used in the making of Scheele's and other arsenical greens. These colors are less used than formerly, however, and arsenic is found rather as an impurity incidental to the manufacture of various dyes or as an ingredient of certain

reagents used in the manufacture of cloth, as for instance, in sizing solutions, to which it is added for antiseptic purposes. As an example of the injury done, a red plaid gingham made into a dress for a child four years old produced apparent poisoning the first day the dress was worn and on analysis 1.024 grains of metallic arsenic per square yard were found.

It is noteworthy that the chromium in black stockings is quite insoluble in boiling water and cannot be removed in this way; nevertheless, it seems that the persipiration, especially that of certain persons, acts as a solvent on the chromium salts; certainly some persons are more susceptible than others to such poisoning. It is perhaps necessary also that a slight abrasion of the skin should exist.

The report concludes with the usual record of antitoxin made and the diagnostic work carried on under the control of Dr. Theobald Smith, statistics of cancer in Massachusetts, statistical summaries of disease and mortality and the health of towns, which latter include investigations made by the medical inspector of the board, Dr. Morse.

In typography, arrangement and matter, the annual reports of this board have been familiar for years to all hygienists as standards of excellence, and the present report will do nothing to injure this reputation.

HIBBERT WINSLOW HILL.

Text-Book of Histology. Including the Microscopic Technic. By Dr. PHILIPP STÖHR, Professor of Anatomy at the University of Wurzburg. Fourth American based upon the Ninth German Edition. Translated by Dr. EMMA L. BILLSTEIN, formerly Director of the Laboratories of Histology and Embryology, Woman's Medical College of Pennsylvania. Edited, with additions, by Dr. ALFRED SCHAPER, Professor of Anatomy, University of Breslau; formerly Assistant Professor of Histology, Harvard Medical School, Boston. With 379 illustrations. Octavo, 500 pages. (*Philadelphia: P. Blakiston's Son & Co., 1012 Walnut St., 1901.*) Price $3.00 net.

On picking up this fourth American edition of Stöhr's histology, our attention is arrested by its considerable increase in weight over the German edition. Such an increase we can hardly consider an improvement.

We are surprised not to find an editor's preface to this edition. The body of the book is exactly the same as the third edition. The revision consists of an appendix at the end of the book, an exceedingly clumsy and inconvenient method for the reader. We are very much surprised to find in this appendix, which is the second one the book contains, that many of the illustrations are duplicates of those in the body of the third and fourth editions, so while the title page is correct in intimating that there are 78 more illustrations than are found in the third edition, it gives the wrong impression that all of these are new.

One asks the occasion for such an edition and on whose responsibility it was undertaken. It may be that the recent American edition of an excellent German histology has proven a stimulus to the edition under consideration.

While in the main we can recommend Prof. Stöhr's histology, we cannot approve the methods adopted in bringing out the fourth American edition.

Transactions of the Medical Association of Georgia. Fifty-Second Annual Session, 1901. (*Atlanta, Ga.: Published by the Association, 1901.*)

This volume of transactions indicates an excellent degree of activity in the Medical Association of Georgia. The papers, as a rule, are well presented, practical and in full accord with modern ideas. The discussions reveal more or less difference of opinion. The old straw as to the existence of hydrophobia is once more thrashed over, and several apparently able physicians are arrayed upon the negative. One would think that by this time the most sceptical would be convinced of the existence of the disease. A paper entitled "A new discovery in the treatment of chronic diseases dependent upon cell changes," presented by an Atlanta physician, should not have been published. We have no reason to think that the "Roberts-Hawley Lymph Compound" will ever be official or even heard of among reputable physicians. The author had no right to exploit a private proprietary remedy in the Association and the Association should not endorse it, at any rate without a full knowledge of the character and action of the remedy.

The Pathology and Treatment of Sexual Impotence. By VICTOR G. VECKI, M. D. Third edition, revised and enlarged. (*Philadelphia and London: W. B. Saunders & Co., 1901.*)

The author of this little book has written a scientific treatise upon an important and much neglected subject. The chapters upon the anatomy and physiology of the sexual organs probably contain nothing new, but the work of compilation is judiciously done. The succeeding chapters on the etiology of impotence, forms of impotence, and treatment are the most important. The author takes a sensible view of the mooted question of "frauding" and believes that its injurious influence upon both sexes has been much exaggerated. The treatment of impotence in general and of sexual neurasthenia is discriminating and judicious. Like many other neurologists the author believes that in some cases of sexual impotence good results are often obtained by hypnotism; in fact he regards it as an indispensable remedy in psychical impotence.

Medical and Surgical Reports of the Boston City Hospital. Twelfth Series. Edited by HERBERT L. BURRELL, M. D., W. T. COUNCILMAN, M. D., and CHARLES F. WITHINGTON, M. D. (*Boston: Published by the Trustees, 1901.*)

A most interesting and valuable paper in this series is the report upon 949 cases of pneumonia treated in the City Hospital between the years 1895 and 1900 inclusive. Of these 949 cases 341, or 35.9 per cent, died. This seemingly large death rate was ascribed to the fact that all cases who entered the City Hospital in a moribund condition were included but all mild cases who may have entered after the crises, or when the physical signs had disappeared, were eliminated, as also all children younger than fifteen years. The observations which have been made upon the complications of pneumonia are also of exceeding interest. We are somewhat surprised that ten cases of phlebitis had been observed and that one patient only had died. The number seems large and the mortality small. No mention is made of venous thrombosis in the same connection.

About the only contribution to medical treatment in the article is the numerical demonstration that treatment by means of baths shows a slight percentage against the utility of the bath, as probably might have been expected. The do-too-much treatment seems a shade worse than the do-nothing treatment in pneumonia.

The volume contains sixteen monographs upon various medical, surgical, gynecological and pathological subjects, some of which are of extreme interest and all are valuable.

Dose-Book and Manual of Prescription-Writing: with a List of the Official Drugs and Preparations, and the more important Newer Remedies. By E. Q. THORNTON, M. D., Demonstrator of Therapeutics, Jefferson Medical College, Philadelphia. Second Edition, Revised and Enlarged. Octavo, 362 pages, illustrated. (*Philadelphia and London: W. B. Saunders & Co., 1901.*)

As a careful review of the former edition appeared in Volume VI, of the BULLETIN, little needs to be added except the statement that extensive additions have been made to the present edition, which materially increase the value of the book. The book can be recommended both to students of medicine and practitioners as full of practical and useful suggestions.

Golden Rules for Diseases of Children. By GEORGE CARPENTER, M. D. (Lond.), M. R. C. P. "Golden Rules" Series No. XI. (*Bristol: John Wright & Co., 1901.*)

This is another of the little books published by Wright & Co., which contains much useful information in small compass. The precepts inculcated are excellent. One regrets, however, that the limits allowed by the publishers leave so much unsaid.

Mosquito Brigades and how to Organize them. By RONALD ROSS, F. R. C. S., D. P. H., F. R. S., Walter Myers Lecturer on Tropical Medicine, Liverpool School of Tropical Medicine. (*New York: Longmans, Green & Co., 1902.*)

The object of this attractive little volume of just 100 pages is to show how war can be most effectively waged against mosquitoes. It treats of things to be learnt and things to be done. Among the former are certain elementary facts which in his judgment underlie the whole mode of warfare. He declares, for example, that all mosquitoes breed in stagnant water; that the variety known as *Culex* convey elephantiasis and yellow fever; that the variety known as *Anopheles* carry malarial fever; that the former bite by day and by night and that the latter bite mostly at night; that the larvæ of all mosquitoes require at least six or seven days' life in water before they reach maturity; that adult mosquitoes may live for months even in captivity, hibernating in cold climates and resisting severe frost or severe heat; that where mosquitoes abound in a house larvæ may usually be found within a short distance and that in the great majority of cases, especially in towns, almost every house breeds its own mosquitoes in its back yards or in puddles and drains in the streets close by. If these facts are true the object of a mosquito brigade should be not to exterminate mosquitoes in any entire continent but in the town in which we live and in its suburbs. This involves not killing every mosquito even in this town but destroying as many as possible, and above all, preventing mosquitoes from breeding in the town itself.

To accomplish these ends by concerted action, houses, back yards and gardens should be cleared of all rubbish, cisterns and tubs containing larvæ should be emptied and the larvæ destroyed. Pools, ditches, wells and puddles should be drained or filled up, and, if nothing more can be done, larvæ should be destroyed periodically with oil or by brushing them out with brooms or by other means. The motto should be, no stagnant water. Very sensible directions follow for the organization of mosquito brigades and for destroying the malarial organisms both within and without the animal body.

The book is capitally written in a vein of genial cynicism born of ineffectual effort to get municipalities to act promptly and efficiently in sanitary matters. It should be widely circulated and mosquito brigades should be established in every town. The author's remarks upon Koch's suggestion to cinchonize whole communities to destroy the malarial organisms already present in the human body seem very sensible. He regards such a proceeding unwise and unnecessarily expensive.

Typhoid Fever and Typhus Fever. By Dr. H. CURSCHMANN, Professor of Medicine, Leipzig. Edited with additions by WILLIAM OSLER, M. D. (*Philadelphia and London: W. B. Saunders & Co., 1901.*)

This is the first volume to be published of the English translation of Nothnagel's System of Practical Medicine. It is not necessary to say how much this will be welcomed. To many of the profession a foreign treatise is in very fact a sealed book. To those familiar with German medicine there is no need of reference to the position of Professor Curschmann. He is a recognized authority. In the editing of this volume Dr. Osler has drawn largely from his own experience of typhoid fever, specially from his service in this hospital, where, under his direction, the disease has been systematically studied. Where new material has been added this has been done so that it reads with the original text. The advantage of this must be at once evident on reading the book, and it is to be hoped that the editors of the other volumes will do likewise. The translation is good and the text reads smoothly and well.

About three-quarters of the work is given to typhoid fever and the remainder to typhus fever. The discussion of typhoid fever opens with a section on the etiology. This is complete and as elsewhere there is satisfactory description of the bacteriology. Attention is to be drawn to the summing up of the main points in the form of conclusions at the end of the section. This gives in less than two pages more about the disease than could be considered possible. It must be read to be appreciated. Following this is the section on pathology, which includes both the post-mortem findings and the clinical features. Here again attention must be drawn to an admirable general description of the disease which opens the section. In less than eight pages is given a picture of the disease not surpassed anywhere. One wishes that there were more medical writers who had this power of saying much in few words. The post-mortem findings are described fully and the author then takes up the symptoms and complications. To these of necessity a large space is given. It is not possible to note the divisions in detail, but those dealing with hæmorrhage and intestinal perforation are specially worthy of note. The question of the early diagnosis of perforation is discussed fully. The importance of an accurate knowledge of this complication can not be overestimated. The author lays special stress, and rightly so, on the importance of abdominal pain in this connection. Attention may also be called to the description of the features in the nervous system. But there are so many sections which are worthy of notice that choice is difficult.

Under treatment, the author speaks, of course, for the use of baths. We are glad to note that he considers the use of water at a temperature lower than 70° rarely necessary and advises usually water at a temperature of 78°. This coincides with the experience of this clinic where the ordinary bath temperature is 75° or 80°. He uses but few drugs and these usually quinine, antipyrine and phenacetine, with a preference for the first named.

The same excellent features are found in the discussion of typhus fever. Throughout the whole work there is so much that is admirable that selection is not easily made. It is to be commended most highly and should be read by every student of the diseases of which it treats.

A Text-Book of Diseases of Women. By CHARLES B. PENROSE, M. D., Ph. D., formerly Professor of Gynecology in the University of Pennsylvania. Fourth Edition, Revised. Octavo volume of 539 pages, handsomely illustrated. (*Philadelphia and London: W. B. Saunders & Co., 1901.*)

A full review of the first edition of this work appeared in the BULLETIN, Volume IX. The third edition contains an interesting synopsis of the author's experience in 310 cases of suspension of the uterus, in 211 cases of which he has been able to follow the subsequent history. Several of the illustrations

of cancer of the uterus have been replaced by better ones and the danger of transplantation of cancer cells into healthy tissue during an operation is pointed out. Werder's operation is also described. A paragraph on senile endometritis has been added. Several excellent illustrations of tubal pregnancy have been adopted from Kelly's Gynæcology and a good illustration of a corpus luteum cyst has been incorporated. Primary carcinoma of the ovary is granted a more lengthy consideration. We are very glad to see the use of rubber gloves recommended in abdominal operations but surprised to learn that catgut should be avoided "within the peritoneal cavity," particularly since we now have such sure methods of sterilization as have been proved by bacteriological examination. We also regret to see the glass drainage tube, now a relic of the past, advocated. On page 507, under the heading of Marsupialization, we are told that in some cases where the cyst is densely adherent it should be evacuated and brought to the abdominal incision. "Vegetations, etc., should be removed from the interior of the cyst with the fingers. The opening in the cyst should then be attached to the lower angle of the abdominal incision." It is now well known that the walls of ovarian cysts are composed of lamellæ of connective tissue and that the inner or secreting layers may be peeled off, leaving merely the outer shell of connective tissue with its surrounding adhesions. The cavity remaining, in favorable cases can be obliterated with catgut or, if necessary, it may be drained for a short time. The secreting cyst surface is thus removed at once and not left in situ as the author advises. In conclusion we can merely repeat what was said of the first edition, the illustrations both of the gross and microscopical specimens are well executed and the text concise and clear. The book was written for students and to them it can be recommended as one of the best we possess. T. S. C.

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